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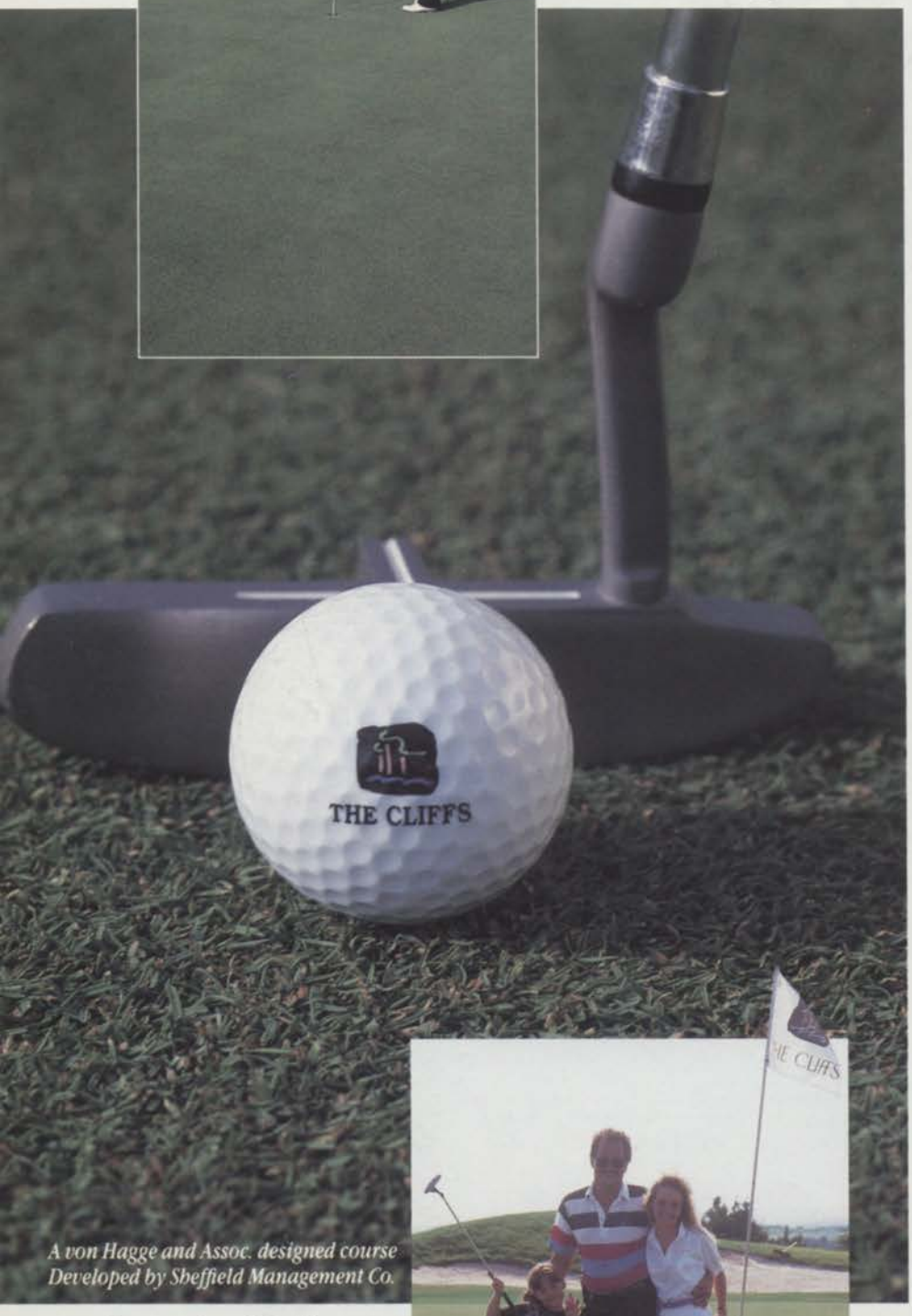

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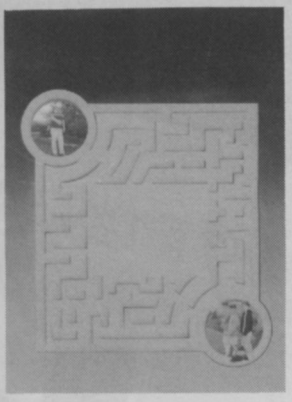

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LANDSCAPE MANAGEMENT (ISSN 0894-1254) is published monthly by Edgell Communications, Inc. Corporate and Editorial offices: 7500 Old Oak Boulevard, Cleveland, Ohio 44130. Advertising Offices: 7500 Old Oak Boulevard, Cleveland, Ohio 44130, 233 North Michigan Avenue, 24th Floor, Chicago, Illinois 60601 and 3475 Lenox Road, N.E., Suite 665, Atlanta, Georgia 30326. Accounting, Advertising Production and Circulation offices: 1 East First Street, Duluth, Minnesota 55802. Subscription rates: $25 per year in the United States: $50 per year in Canada. All other countries: $100 per year. Current issue single copies (pre-paid only): $2.50 in the U.S.; $5.00 in Canada; elsewhere $10.00; add $3.50 per order for shipping and handling. Back issues, if available, $10; add $3.50 per order for shipping and handling (pre-paid orders only). Office of publication: Edgell Communications, Inc., 1 East First Street, Duluth, Minnesota 55802. Second class postage paid at Duluth, Minnesota 55806 and additional mailing offices. Copyright© 1990 by Edgell Communications, Inc. All rights reserved. No part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical including photocopy, recording, or any information storage and retrieval system, without permission in writing from the publisher.

POSTMASTER: Send address changes to LANDSCAPE MANAGEMENT, P.O. Box 6198, Duluth, Minnesota 55806.

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AS I SEE IT...

Pay me now, pay me later

The soccer field sloped a good three feet from its southern goal mouth to its southwest corner. One of the turf experts surveying it said that if he were coach he'd "put my best left-footed kicker on the top of the hill and everybody else at the bottom."

Just down the road, the varsity football field was rutted, muddy in spots and hard. There was no way, I thought, that I'd ever play on that field—even if it meant a date with the head cheerleader.

These are real fields. Though their poor condition is a commonality, the *reasons* for their poor condition are radically different.

The soccer field is in a beautiful public park. There is money to improve the field; it's just been mis-appropriated by those holding the purse strings.

Taxpayers spent their park money on wonderfully modern halogen lights for the softball fields, a paved fitness trail and picnic pavilions, instead of opting to level the soccer fields. Someone—the architect, the engineer, the construction company—had simply misplaced priorities.

The football field is nestled behind a fairly large old high school. There is *no* money to improve the football field; no money to paint the grandstand; no money, even, to replace some of the windows in the school building. What little available money is directed toward other needed projects, like textbooks.

"If only he had some resources," one of my comrades noted, pointing at the field manager. "There's a man who loves his work, is dedicated to it. But his hands are tied." Any leftover money appropriated for landscape work is automatically diverted to the school's front lawn, where passing motorists can easily see their tax dollars at work.

What the taxpayers don't realize, however, is that when you spend money on things other than making athletic fields safe, you're flirting with disaster. That's the seven-letter type of disaster called L-A-W-S-U-I-T.

There's never been a survey done, but I'd bet that for every rutted, ill-kept athletic field in this country there exist about 15,000 attorneys, each waiting for the imminent twisted limb or broken neck that will pay for his or her next trip to Acapulco.

Insurance specialist Jim Leatzow, a frequent contributor to this magazine, agrees.

"When a kid gets hurt in a high school football game and there's a bald spot anywhere near where the accident occurred, *multiple* attorneys will come out of the woodwork," Leatzow notes from experience. "They allege either improper design or maintenance."

Leatzow says the quest for libel suits against the owners of athletic fields and park systems "is hot stuff." Further, he makes the point that if fields are not well designed and maintained, "they're flirting with disaster."

If this sounds serious, it is. Their message is clear for those in charge of athletic fields: "You can pay now, or you can pay later."

Jerry Roche

Jerry Roche, executive editor

LM

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Larry Hanks, VP Golf Operations; North Star Development Co., Inc. at Deer Creek, Overland Park, KS.

"When planning our World-class, Robert Trent Jones II designed golf course in the Kansas City area, we had to seriously consider our hot, dry summers. We simply could not leave the all-important turf areas to chance. Penncross bent was selected for the greens, zoysia for the tees and fairways, and tons and tons of Triathalawn blend was seeded into the roughs. Our tees, greens and fairways will receive adequate water, but we're counting on Triathalawn's deep-rooting to look good in the unirrigated areas ... especially around our stately trees.

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Everett Mealman, President
PBI/Gordon Corporation

Yellow nutsedge can be devastating if it gets out of hand because of the way it spreads from its roots. Just ask Lentz Wheeler, superintendent of the Hidden Creek Country Club in Reston, Virginia, which is recognized as one of the better maintained courses in the Washington D.C. area.

"We had two years of drought," says Wheeler, "followed by a year of excessive rain, and it brought on an undesirable infestation of yellow nutsedge" — totally unacceptable for a course like Hidden Creek.

Wheeler goes on to say that he tried several post-emerge herbicides but, in his words, "the main thing we got from them was a lot of phyto, which I wish had been on the nutsedge rather than on our fairway grass.

"Trimec Plus turned out to be the product that came to our rescue. One treatment with Trimec Plus," says Wheeler, "gave us back the type of fairways we could be proud of."

Lentz Wheeler, superintendent of Hidden Creek Country Club in Reston, Virginia, savors his handiwork on an immaculate fairway that once was plagued with yellow nutsedge. Wheeler says that Trimec Plus did a thorough job of cleaning out the nutsedge, and the cost was surprisingly low. Wheeler was equally impressed by the fact that Trimec Plus also did an excellent job on the few tough broadleaves that were present.

So Trimec Plus gets yellow nutsedge, and it is economical. But how about crabgrass?

"If you want to talk about crabgrass, talk to us," say Ted Davenport and Gerald Krohn, of Bay Landscaping, Inc., Essexville, Michigan (Saginaw, Midland, Bay City).

To fully appreciate what they have to say about Trimec Plus and crabgrass, you need to know that the residential division of Bay Landscaping mainly services upscale homes, most of which they originally landscaped. They have their own pride in those lawns, and they can't abide even the slightest blemish.

"We nearly always have excessive spring moisture," says Davenport. "It tends to leach out the pre-emerge and when the hot weather hits, so does the crabgrass, right along with the summer annual broadleaves. To be on the safe side, our program consists of a broadcast treatment of Trimec Plus for the second and third applications.

"This will be our fourth year with Trimec Plus," continues Krohn, "so you know what we think of it . . . It does a beautiful job of controlling crabgrass and other course grasses, along with every conceivable type of broadleaf."

So Trimec Plus gets yellow nutsedge; it gets crabgrass; it gets broadleaves; it's economical. But how fast does it work?

Ted Davenport, left, lawn care applicator of Bay Landscaping, Essexville, Michigan, and Gerald Krohn, in charge of lawn service. They always carry an SP1 Back Pack Sprayer loaded with Trimec Plus. They have found that the SP1 and Trimec Plus are the ideal combination for spot weeding. Not only does Trimec Plus get grassy weeds and nutsedge, but broadleaves as well. The SP1 Back Pack Sprayer is a $100.00 value, but you can receive one for only $35.00 when you buy Trimec Plus.

Reed Hull, left, president of Vita Lawn Corp., Rancho Cordova, California, and Bradley Belcher, general manager, say that Trimec Plus often knocks out crabgrass in one application without any phyto or discoloration to their Bermudagrass turf. Before the advent of Trimec Plus, Vita Lawn used 6-lb. MSMA, which usually required three or even four treatments to get crabgrass without phyto. They are also very pleasantly surprised by the control of dallisgrass they are getting with Trimec Plus.

You want fast results — you want to talk to Reed Hull and Bradley Belcher of Vita Lawn Corp., located in the Rancho Cordova surburb of Sacramento.

Vita Lawn is a very highly regarded lawn service company, and when the crabgrass hits in Sacramento, Vita Lawn's phone rings off the wall with homeowners who want to become new customers . . . right now!

"We've traditionally sold these new customers a three-application rescue program for their grassy weeds," says general manager Belcher. "In the past, using 6-lb. MSMA, we had to spread it out over three treatments or more to get the crabgrass without phyto. Trimec Plus often will do the job with just one application and, if we're back two or three times, it is usually because we're after dallisgrass."

What is Trimec Plus?

Trimec Plus is a Complex that was designed by PBI/Gordon research to solve the problem of grassy weeds like crabgrass, dallisgrass and barnyardgrass, as well as nutsedge, in ornamental turf.

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GREEN INDUSTRY NEWS

MAY 1990, VOLUME 29, NUMBER 5

LANDSCAPE MANAGEMENT

LEGISLATION

Lawn and golf pesticides get kicked in the backside

WASHINGTON, D.C. — Green industry interests were joking that Lt. George Prior has become "the man who wouldn't die." But it was no joke as the U.S. Senate held a subcommittee hearing on the alleged dangers of turf pesticides here March 28.

The most forceful and bitter witness to appear during the all-day session was Thomas Prior of Maplewood, N.J., who graphically recounted the death of his brother George eight years ago—several weeks after playing golf at a local course. Prior unhesitatingly blamed the death on exposure to a fungicide which had been applied to the golf course.

"There is a clear need for the government to take a more active role (in pesticide control)," Prior said. "It was established beyond doubt that chlorothanil (Daconil) killed my brother."

Prior also said that testing laboratories paid for by pesticide manufacturers "have been abused" and that "there are no industry-wide standards for training or application."

Also taking the stand were 11-year-old Kevin Ryan of Arlington Heights, Ill. and Sharon Malhotra of Murrysville, Pa.

Ryan said, "I can't function mentally when I'm exposed to pesticides. I can't even play in my own yard because my neighbors spray their lawns. And being on a baseball team is a dream I've given up on because all the ballfields are treated.

"They (lawn care companies) are robbing me of my childhood, and I am angry with my country for allowing these untested chemicals to be applied by untrained applicators."

Said Malhotra, who complained of severe headaches, numbness, nausea and muscle twitches because of pesticides: "Everytime I leave my home, I'm risking exposure to pesticides. Hundreds of thousands of Americans' lives have been seriously compromised." Then—with passion: "Give us a chance to live normal, productive lives again."

Room 216 of the Hart Building in Washington, D.C. was site of a Senate subcommittee hearing on lawn pesticides. Sen. Harry Reid (D-Nev.) (center, facing camera) presided.

Senators in attendance were John Warner (R-Va.), Harry Reid (D-Nev.) and Joe Lieberman (D-Conn.). They did not ask for testimony in favor of turf pesticides until later in the day, when most media representatives had left to file their stories.

Representing the golf course industry was William R. Roberts, government relations chairman of the Golf Course Superintendents Association of America (GCSAA).

"The goal of the GCSAA is to work with legislators and regulators to protect the environment," Roberts said. "We do not intend to deal in the emotions of the moment. We will spend our dollars on research and education. We will not spend our dollars in the courtroom challenging the regulatory process.

"Golf is honestly trying to...leave our home base here on earth...a little bit better."

The hearing was called as a response to a General Accounting Office (GAO) report. Testifying for the GAO was associate director Peter F. Guerrero, who chose to focus on alleged cases of false advertising by the lawn care industry.

"We believe that the

continued on page 11

SENATE *from page 8*

public should be protected from pesticide advertisements that convey the impression of safety," Guerrero said, noting possible cancer risks, birth defects and other potential long-term effects of pesticides. "The industry continues to make advertising claims that its products are safe or non-toxic while federal enforcement actions against such claims remain limited."

The lawn care industry contends that use of such terms as "practically non-toxic" in advertising are accepted in the scientific community and not misleading.

"The disputed facts are before the court but, as of this date, have not been adjudicated," said Dr. Roger Yeary of ChemLawn.

Sen. Reid, chairman of the subcommittee, signalled the hearing's tone with his opening statement:

"Remember, lawn chemicals by their very design are dangerous," he noted. "Pesticides are designed to kill. And what kills garden pests and weeds can also have an adverse health effect on people."

Golf course superintendent Bill Roberts (left) and Dr. F. Eugene Hester (right) of the National Park Service testify.

Sen. Lieberman, whose statement was also made before the media's mass exodus, was even more emphatic.

"In some cases," Lieberman noted, "lawn care chemicals are toxic to humans. In some cases, lawn care chemicals can kill people. That is truth.

"Too many of the makers of lawn care chemicals and the purveyors of lawn care services have been irresponsible in dealing with the risks associated with the products. And, I'm sorry to say, the government has been derelict in its duty to protect the public interest."

Taking the stand to defend turf pesticides were Roberts, Tom Delaney of the Professional Lawn Care Association of America, Dr. James Wilkinson of the Pesticide Public Policy Foundation, Jay Vroom of the National Agricultural Chemicals Association, Yeary, Dr. Warren Stickle of the Chemical Producers and Distributors Association and Dr. Michael Gough of the Task Force II on 2,4-D Research Data.

Lining up on the other side were Guerrero, Ryan, Malhotra, Prior, Attorney General Robert Abrams of New York, Dr. Sheila Zahm of the National Cancer Institute, Anne Bloom of Public Citizen and Jay Feldman of the National Coalition Against the Misuse of Pesticides.

—Jerry Roche□

WHAT THEY SAID IN WASHINGTON...

Selected quotations from testimony offered to the Senate Subcommittee on Toxic Substances, Environmental Oversight, Research and Development:

● *"These are issues that have been neglected. We'll hear testimony that will get people talking."*

—Sen. Harry Reid

● *"I'm really concerned that the EPA has let this go on and on. We're dealing with real problems that deal with real people."*

—Sen. Reid

● *"The industry has stonewalled us in court. Your own estimates indicate that as many as 30 to 40 million people could be chemically sensitive."*

—Hon. Robert Abrams

● *"We do not intend to take the time of the subcommittee to present a detailed critique of the (Public Citizen) report, except to state that it is unauthoritative, inaccurate and misleading."*

—Dr. Roger Yeary

● *"The GAO says that we have too little information about most of the widely used lawn chemicals to say they are safe for people. Yet all of them are sold with the words 'EPA Registered' right on the label. And none of them are sold with adequate warnings.*

—Sen. Joseph Lieberman

● *"GAO found that the lawn pesticides industry continues to make claims (prohibited by FIFRA) that its products are safe or non-toxic. EPA considers these claims to be false and misleading."*

—GAO report

● *"Of the 40 pesticides that comprise over 95 percent of the chemicals used by commercial lawn care firms, 12 are suspected carcinogens, 21 have been shown to cause other long-term health effects in lab animals or humans, and 20 have been shown to cause short-range damage to human central nervous systems."*

—Anne Bloom

● *"We are facing a national pesticide exposure crisis, the dimensions of which are not adequately calculated by the U.S. EPA. At the same time, people are getting sick from non-agricultural pesticide exposure in their homes, offices, schools and workplaces, through direct exposure, drift, volatilization, or by way of residues on treated landscapes."*

—Jay Feldman

● *"Manufacturers are making significant strides in diagnostics. These improved programs, involving state-of-the-art detection and identification kits, go a long way toward enhancing our targeted use of available technology."*

—Jay Vroom

● *"EPA should address the public's confusion about pesticide registration by banning pesticides containing known or probable carcinogens to be used for aesthetic purposes like lawn care."*

—Mr. Abrams□

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SHORT CUTS

FLORIDA PROFESSIONALS... The projected completion date for the first professional landscape standard in Florida is June 1, according to *Florida Nurseryman* magazine. The Florida and Nursery Growers Association (FNGA) has established a Certified Landscape Contractor (CLC) Committee that is busy formulating the standard. "The program was established in response to unprofessional bidding practices from newcomers who didn't understand the cost of doing business nor have the professional knowledge required," the magazine notes. For more information on the CLC program, contact the FGNA at 5401 Kirkman Rd., Suite 650, Orlando, FL 32819; (407) 345-8137.

MOWING FOR FREE...George E. Renault III, superintendent at the Chevy Chase (Md.) Club, won the use of a Ransomes Fairway 5000 mower for one year, in a drawing held at the February GCSAA convention. "It feels great to be the winner," says Renault, "and I'm really looking forward to using the Fairway 5000 this season. We're anxious to put it to the test."

DECIDING THE FUTURE...Tom Lied believes the landscaping industry is "young, dynamic and on the threshold of busting loose." In comments to the Ohio Landscape Association, the owner of Lied's Nursery, Sussex, Wisc., stressed the importance of looking ahead. "We look 10 years ahead, we decide where we want to be, then we do something about it," Lied said. According to Lied, "the client is king," and everything a company does must be done to satisfy the client. "We got big by serving our clients, and by listening to them. If they wanted something, we granted their request."

PLEASE WELCOME...the Association of Montana Turf and Ornamental Professionals (AMTOP), which was recently formed in Helena. AMTOP's new president is **John Bass**, who believes in the need for unity and professionalism. AMTOP has also selected a board of directors and formed a committee to formulate the group's goals. Welcome to the fold.

A NEW FACE... The world's first landscaped garden, begun in the first half of the 18th century, at Stowe in the rolling English county of Buckinghamshire, northwest of London, is to be restored to its original splendor at a cost of £10 million (about $16 million). A recent anonymous donation of £2 million will be used, along with monies from a public appeal for £1 million. A boys' school, which took over a house on the property, will remain.

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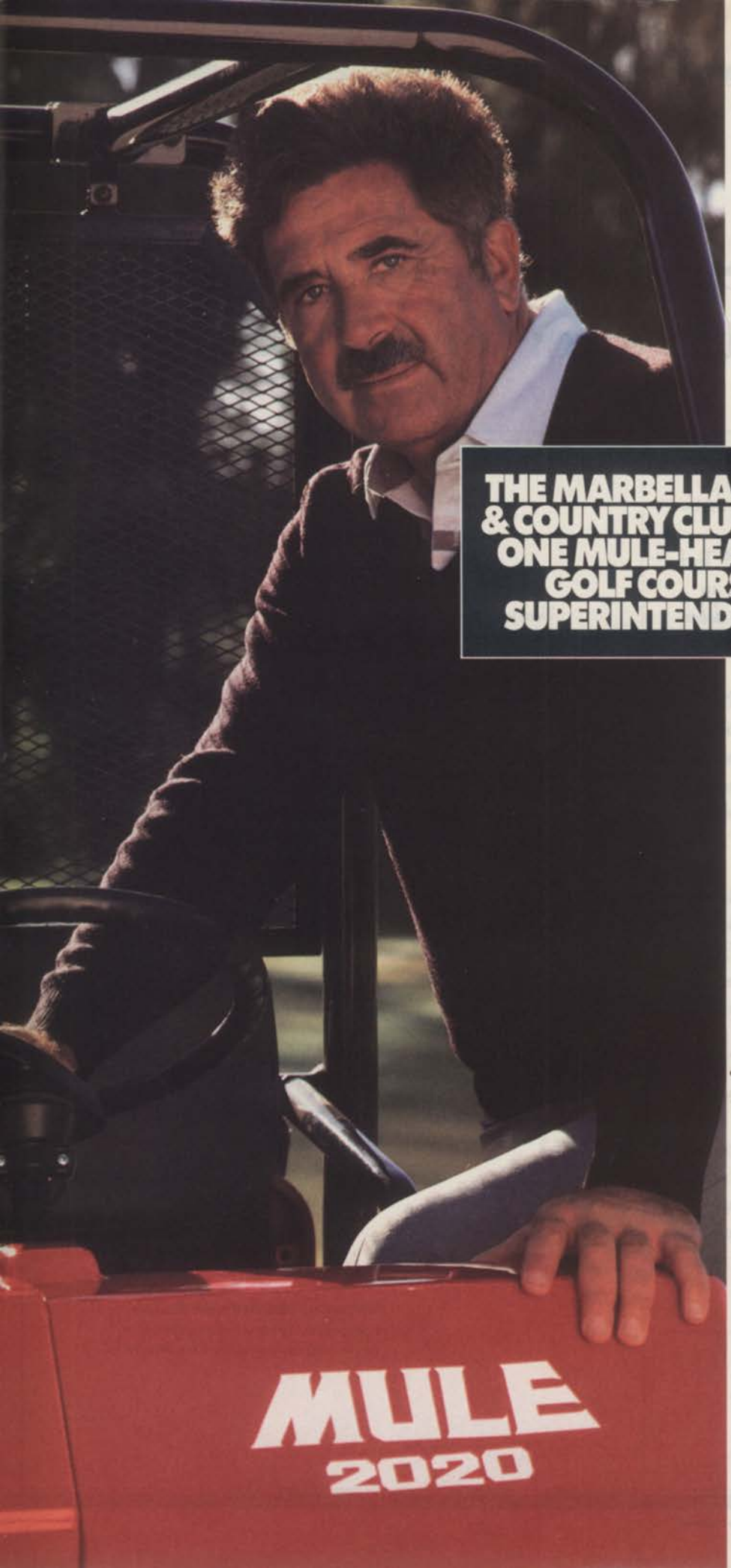

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LEGISLATION

'Day on the Hill' goes over big; LCOs surprised

WASHINGTON, D.C. — A "Day on the Hill" program here, co-sponsored by the Professional Lawn Care Association of America (PLCAA) and Monsanto Chemical Co., resulted in 35 visits by lawn care businessmen to their Senators and Congressmen.

"The feedback we got was extremely positive," said Dr. Dave Duncan of Monsanto. "Most of the LCOs had some anxiety coming in, but when they got up on the Hill, they found out that their representatives were real people.

"We also found out that the PLCAA really needs to have a legislative agenda. A presence in Washington has been missing."

Eighty representatives from the lawn care industry and its media turned out for the two-day event, said Jim Altemus of Monsanto.

The Hon. Cooper Evans talked to LCOs in Washington's Executive Office Building.

Besides the visits with their legislators, LCOs also sat in on a presentation by the Hon. Cooper Evans, special assistant to Pres. Bush for agriculture and food issues, at the White House; and one by Dr. Paul Shouda of the EPA Office of Pesticide Programs.

Evans noted that the Bush administration will continue to support states' rights when it comes to pesticides.

"The administration has a fundamental belief in states' rights, (except when) the situation on a national scale becomes chaotic. But until we have re-done the reviews, it is the administration's belief that the states have no right to preempt federal legislation."

PLCAA president Rick Steinau, who—with Duncan—originated the "Day on the Hill" concept, was pleased.

"This turnout is a definite statement that the PLCAA did a good job," he said. "We also want to get the state associations involved in this kind of event, too."

Any lawn care operator with questions or an interest in attending "Day on the Hill" 1991 should direct them to the PLCAA, 1000 Johnson Ferry Rd. NE, Suite C-135, Marietta, GA 30068-2112; phone (404) 977-5222.

—Jerry Roche□

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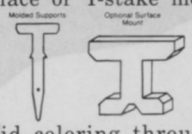

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2. Landscape Timbers 301*
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4. Dura Bench 303*
5. Hi-back Bench 304*

*Indicates Reader Service Number for individual product.

LEGISLATION

EPA administrator promises a closer look at lawn care

WASHINGTON, D.C. — Testifying at a Senate subcommittee hearing, Victor J. Kimm of the Environmental Protection Agency (EPA) sounded a warning to lawn pesticide applicators.

"EPA will be paying close attention to lawn care and other home pesticide uses, as we go through the re-registration process mandated by the 1988 amendments to FIFRA," he promised.

Kimm, deputy assistant administrator for pesticides and toxic substances, said the EPA will monitor advertising.

"In light of our increasing concerns over lawn care advertising as well as general pesticide advertising, EPA and the Federal Trade Commission (FTC) met on Feb. 22 and decided to implement formal procedures for referral of pesticide advertising cases between the two agencies."

Kim also noted some National Pesticide Telecommunication Network (NPTN) statistics in his testimony.

From April 1 through Sept. 30, 1989, for instance, the NPTN received 18,935 telephone calls, including 3,148 calls reporting adverse effects. Of those callers, 424 reported lawn care-related incidents, including 233 cases of human exposure, 96 cases of animal incidents and 95 cases of damage to plant material.

"These figures suggest that incidents are occurring, although not necessarily at an alarming rate," Kimm said. "Also, this information should be treated with some caution since it is unverified."

This summer, Kimm said, the EPA plans to conduct a National Home and Garden Pesticide Use Survey, interviewing 2,000 Americans, to provide data on all types of pesticide use by homeowners, including lawn care pesticides.

Kimm noted that the EPA is considering legislation requiring lawn care and landscape companies to post after pesticides are applied.

"Although we are not seeing evidence that lawn care is a use pattern posing an unusual degree of health or environmental risk, we can agree that there are issues here that require the agency's careful consideration."

—*Jerry Roche*□

BUSINESS

Design/build tops expansion

CLEVELAND — A recent survey conducted by this magazine indicates that more landscape contracting companies are creating new or expanding existing design/build capabilities than ever before.

Of 118 responses to the question "How do you intend to expand your company?," 55 referred to design/build services.

Next most popular area into which landscape contractors are expanding are ornamental care and aeration/renovation.

Questionnaires were mailed this spring to 500 landscape contractors who receive LANDSCAPE MANAGEMENT.

Environmental considerations—including current and pending legislation—were cited by 34 percent of the respondents to another question: "What trends will change your

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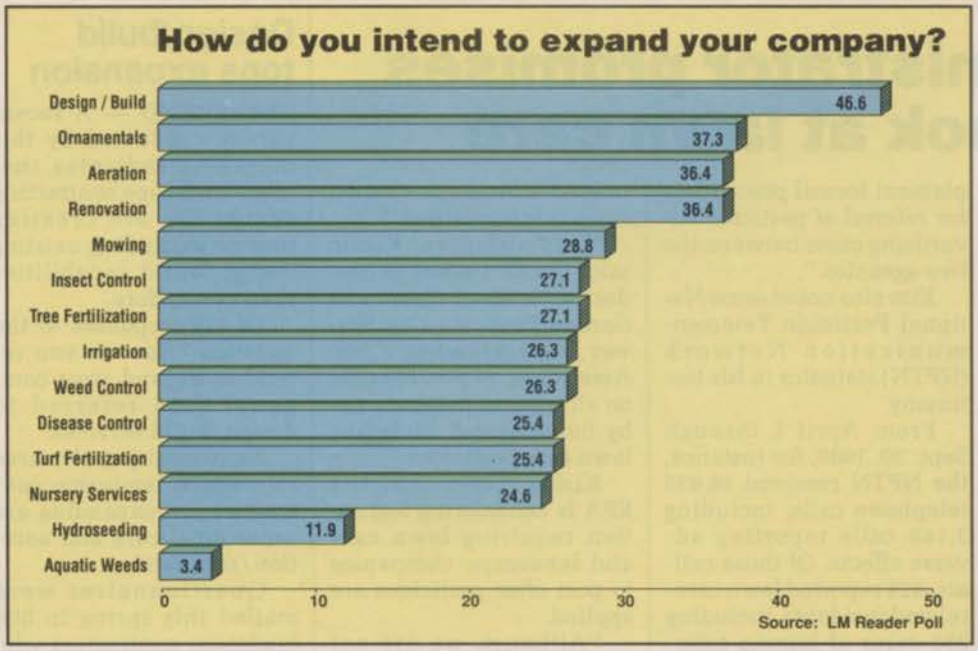

company or force you to change the way you currently do business?"

Second behind environmental considerations was the labor shortage. (Most recent statistics compiled by the U.S. Department of Labor indicate that unemployment is decreasing by about 1/10th of one percent per month.) Also mentioned as business considerations in the landscape industry were waste disposal, insurance rates, housing starts, use of computers and water considerations, in that order.

(See chart.)

Among new services landscapers plan to provide to clients this year, the most popular is lighting (9.3 percent). Others cited by multiple respondents are aeration, irrigation, nursery/garden centers, tree care services and "hardscaping." □

LEGISLATION

Reporting law passes in Calif.

FRESNO, Calif. — California's new pesticide reporting law—A.B. 2161—is now in effect throughout the state, and requires that virtually every pesticide user report all monthly pesticide applications.

The new law covers the reporting of materials that users have not had to report in the past, and applies to pesticide applications on golf courses and turf and sod farms, in cemeteries and parks, and along roadways. Reports are due by the 10th of each month preceeding the application.

Industry sources say they hope the law will help to temper the initiative drive of California Atty.

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This arboretum a handy reference

Research associate Ron Walden poses in front of the Tidewater Arboretum at the Hampton Roads (Va.) Agricultural Experiment Station. The arboretum is a handy reference for landscapers in that section of the country. "People always want to do landscape design over the phone," says VPI-SU extension agent Randal W. Jackson. "I've stopped doing that. I tell them to visit the arboretum." Walden says the arboretum lets landscapers see what mature plants will look like in the landscape. The arboretum, established in 1975, includes more than 300 relatively new and/or unusual plants, most of which have been donated by Virginia nurserymen. The plants are fertilized with 18-6-12 Osmocote, a product of Sierra Chemical Co.

Gen. John Van de Kamp, due to come up for a vote in November. The initiative seeks to outlaw all control products containing inert ingredients known to cause cancer or birth defects — even if enormous, unrealistic doses of those ingredients are required for a person to be at risk.

If passed, 50 to 80 percent of pesticides used in California will be eliminated. □

LITERATURE

ALCA releases a pair of 'tools'

FALLS CHURCH, Va. — The Associated Landscape Contractors of America (ALCA) has released a detailed report on contracting in the 1990s and, along with it, a 21-minute pesticide training video.

The report, "Landscape Contracting Today and in the Year 2000," looks at market trends, marketing and public relations, business structure and systems, legislation and other subjects. Written by ALCA's "Crystal Ball" Committee, it can be obtained for $3.

The training video is designed to show interiorscape technicians and supervisors who train technicians how to safely apply pesticides and how to clean up and handle spills.

The video's price is $65 for members and $95 for non-members.

To order either, phone ALCA at (703) 241-4004. □

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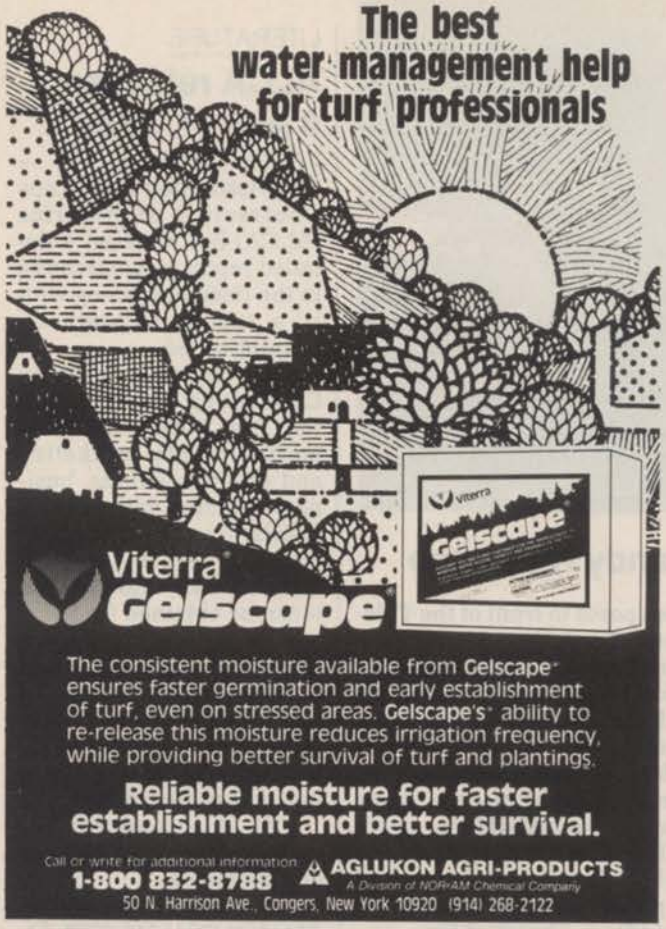
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TURFSEED

Feds raid seed company, allege false statements

SALEM, Ore. — Federal agents entered the offices of the Olsen-Fennel Seed Co. here, seeking evidence of alleged false statements made to obtain phytosanitary seed inspection certificates.

Records, ledgers and documentation were seized during the April 5 search.

The affidavit alleges that Olsen-Fennel officials obtained the certificates for seed previously imported from Argentina by representing the seed as U.S.-grown. The seed was then exported to foreign buyers.

Assistant U.S. attorney Kent Robinson says such actions would be in violation of the U.S. Code which prohibits false statements to government agencies and wire fraud. Both carry maximum penalties of five years imprisonment and fines of up to $250,000 for individuals and $500,000 for corporations.

In an unrelated action, the state Department of Agriculture suspended the company's license for thirty days for selling or attempting to sell uncertified, mislabeled seed from Argentina to various U.S. buyers.

Investigations revealed the company knowingly sold grass seed lots that were mislabeled and misrepresented.

Company vice president Richard Olson said federal officials are at fault.

"This Argentina tall fescue entered the country with (federal) approval and they authorized us to go ahead and distribute it," said Olson. "After we did distribute it, that is when they found serrated tussock in it, and found out that their records were not correct and they should not have allowed it (into the U.S.) in the first place."

Olson withheld comment on the allegations that company officials made false statements, but again charged the federal government with delaying action.

"It's ironic that when we asked the federal government for help in this situation," said Olson, "they didn't have the time or the money to help us out of a problem they created. But they certainly seem to have the time and the money to pursue it from the other direction."

—*Terry McIver*□

LETTERS

Florida super intends no harm

To the editor:

I would like to clarify my position on an interview done with me in your February 1990 issue ("Florida's Best").

While I don't think it was the intent to produce a negative article, several of my peers interpreted it as such.

In the interview concerning northern superintendents coming to Florida, I did not initiate the subject but was asked my opinion. My emphasis was as strong about a southern superintendent going North as a northern superintendent coming to Florida.

My objective was to point out how complex and diversified golf course superintendents' positions are today in light of aggressive environmental regulations, membership expectations, etc. If anyone believes that a transition from extreme North to South or vice versa is easy, they are not saying much about the complexity of our jobs.

William T. Hiers
John's Island Club,
Vero Beach, Fla.

Mistaken plant

To the editor:

Your February issue included an article entitled "Shout Spring With Colorful Bulbs" by Ann Reilly. While the article was well written, I did note one error. The caption under the first photograph indicated that the scene was located in Colonial Williamsburg; however, this is not the case. The photograph was taken in the Virginia Beach Municipal Center.

While we are pleased and indeed flattered that our efforts have been confused with those of Colonial Williamsburg, we would like to, nonetheless, point out this error.

Edward S. Barnes
Landscape Administrator
Virginia Beach, Va.

To the editor:

Regarding Dr. Rao's answer to a question on pH adjusting in LANDSCAPE MANAGEMENT, February):

Additional products widely used to buffer pH (not acidize the tank as most other iron products or phosphoric acid will do) are Agri-Plex and Lawn-Plex by RGB Laboratories. We don't know of any other micronutrient products which are *true* buffers (adjust pH up or down) besides the above-mentioned products. Therefore, you need not buy pH-adjusting solutions; you get the iron/micronutrients for nothing.

Stephen L. Gaynes
RGB Laboratories
Kansas City, Mo.

Correction

In the special advertising supplement which appeared in the February issue of LANDSCAPE MANAGEMENT, it was stated that Paul Luccia works for Heyser Landscaping.

Luccia is not, nor was he ever, employed by Heyser. LANDSCAPE MANAGEMENT apologizes for the error and any inconveniences attributable to the error. □

EVENTS

MAY

16: North Carolina Turf and Landscape Field Day, N.C. State University Turf Field Center and Arboretum. Contact: Bill Wilder, P.O. Box 400, Knightdale, NC 27545; (919) 266-1777.

28-June 1: International Conference on Geotextiles, Geomembranes and Related Products, The Hague, Netherlands. Contact: The Secretary General, 4th Geotextiles Conference, Holland Organizing Center, 16 Lange Voorhout, 2514 EE, The Hague, Netherlands.

JUNE

8-9: Playground Design and Safety Symposium, Chicago, Ill. Contact: National Institute, P.O. Box 1936, Appleton, WI 54913.

11-12: Metropolitan Tree Improvement Alliance annual conference, Morton Arboretum, Lisle, Ill. Contact: Tom Perry, METRIA executive director, Natural Systems Associates, 5048 Avent Ferry Rd., Raleigh, NC 27606; (919) 859-0031.

11-15, 18-22, 25-29: Landscape School of the South Short Courses, Louisiana State University. Contact: Dr. Neil Odenwald, LSU, (504) 388-6621 or (800) 234-5049.

14-16: Lighting World Trade Show, McCormick Place Exhibition Hall, Chicago, Ill. Contact: Bill Schoenfisch, Illinois Chapter, American Society of Landscape Architects, (914) 658-8393.

21: Troubleshooting Seminar for Tree Planting, University of California, Riverside. Contact: Hartley Bennett, P.O. Box 414, Wickenburg, AZ, 85358; (602) 684-7308.

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Sevimol® can be used to protect your trees and ornamental plantings, as well.

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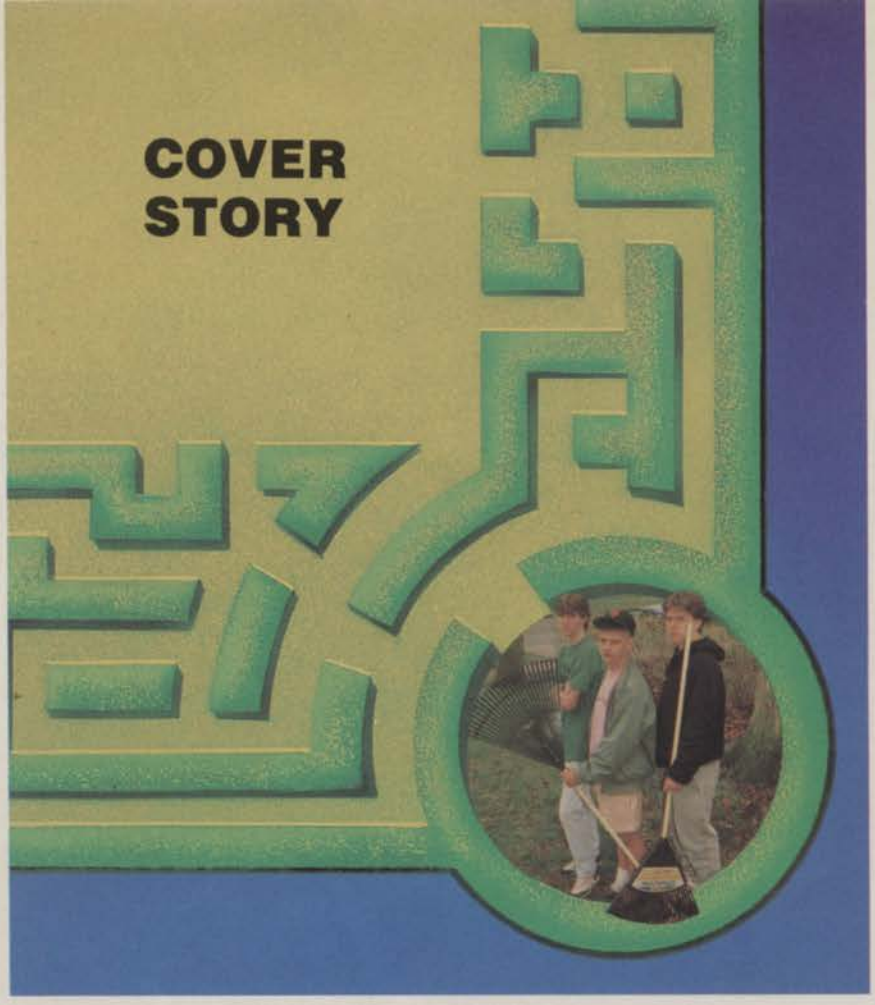

FINDING (AND KEEPING) SEASONAL HELP

Tomorrow's leaders are among today's seasonal labor force. Challenging, educating, and having fun with them is one way to insure a bright future for the entire industry.

by Will Perry, managing editor

Like most young American college kids, Gerald Faubel needed a summer job. So between semesters at Iowa State University, the young man jumped at an opportunity to work at a central Illinois golf course owned by a friend's uncle.

So began a life-long love affair with the game and the role of superintendent.

"I really *knew* I wanted to be on a golf course," said Fauble in a recent magazine profile. "I was fortunate finding that out early."

Today Faubel is superintendent of beautiful Saginaw Country Club in Michigan. He has been an active member of the Golf Course Superintendents Association of America (GCSAA) for years, working on the organization's Scholarship and Research and Governmental Relations programs. Today, as GCSAA's newly-elected president, he's in a position to give even more to the industry and the game in the 1990s.

Faubel's association and contributions to the green industry date back to that first summer job on the course. Like Faubel, hundreds of other green industry leaders began their careers with that summer job at a golf course, landscaping or lawn care company.

That time again

At this time of year, when landscapers across the country are gearing up for summer, thousands of young people will seek some of the many opportunities open to them in the green industry. By providing an intriguing, educational, and fun work environment, it encourages their contributions.

The first step in hiring summer labor is finding the strongest candidates. The catch is that if you started looking today, you're already too late.

"If you're looking now, you're probably too late as far as finding the best employees," says Ed Wandtke, senior associate member of All-Green Management Associates, a Columbus, Ohio-based consulting firm that works closely with the green industry. "What you're going to find now is what's still available."

Year-round job

Wandtke says finding the best and brightest seasonal employees is a year-round job. "Most often the ideal time to meet those kids is in the fall," says Wandtke. "If you can bring them on board part time or even for a few days in the off-season, you get a good test of their abilities and give them an idea of what the work is like."

Wandtke warns that by waiting until summer for seasonal hiring, managers run the risk of losing people who feel the job isn't what they thought it would be. "It's a job that requires long hours at relatively light pay, so managers have to work that much harder to find individuals who are willing to start at the bottom of the pay scale and work their way up."

The preferred method of finding people remains referrals from current employees. Wandtke suggests offering employees a $50 bonus if you hire their referral, $50 to each after the new employee completes 90 days, and perhaps $100 apiece if the referral stays on board for the entire season. "From a competitive point of view, there's not a lot of people doing that right now, but there should be," says Wandtke.

Where to advertise

He also recommends advertising in local churches as opposed to news-

Wandtke: Churches are a great source for part time help.

Voigt: Just because they're students doesn't mean you pay less.

Lied: Motivation is a good environment, pay, and overtime.

papers. "People who attend church traditionally offer much more stable employment. It's the transference of the fact that the person has certain values in his or her life. Whether or not you agree with the church they go to is irrelevant. The fact is there's a significant difference between them and a lot of other people."

From Pebble Beach to Augusta, the men and women who have and will continue to shape the industry have often risen from the ranks of seasonal labor.

Michael McKinley concurs. "You recruit every day of your life," says the Eau Claire, Wisc.-based consultant. "You never stop looking for people, even if you have a full staff or plenty of time until spring."

Stay in touch

Even in the dead of winter you can keep prospective employees at hand by staying in contact with them. McKinley suggests inviting them to a holiday party or winter planning meeting. Let them know they'll be an important part of your spring operations.

Other stocked labor pools include local community colleges and universities (especially horticulture students), job fairs, area athletic coaches, state career centers, and government training programs.

Summer workers interested in landscaping as a career should be given a broad range of work experience and plenty of encouragement.

Seeing a star

Employees who are strong candidates for careers in the green industry display responsibilty, dedication and enthusiasm for the work. They should be provided an environment that will give them the broadest range of experience, says Tom Lied, president and founder of Lied's Landscape Design and Development in Sussex, Wisc.

"We do everything we can, and I think all industries should," Lied says. "Give them a wide range of experience and let them test their enjoyment of the industry instead of having to dig holes all day. That's certainly not going to give them an idea of what the industry is all about.

"The students who might be looking for a career in our industry come to us to test their aptitude for the work and their enjoyment of it. They ought to be handled differently and, quite frankly, too often in our industry they're not. They're taken advantage of. They're told they're going to get experience, but what they often get is an experience in futility because they're not allowed to find out what's going on or to challenge themselves.

continued on page 28

They're used as cheap, grunt labor."

The curious employee tends to ask a lot of questions about why things are done or how the company operates. Therefore, strong employee-manager communication is important to develop this person.

Mentors on hand

"Every organization should have a mentor who the student can feel good about approaching with perplexing questions he or she might want to bounce off somebody. They need someone to guide their progression, someone who listens to them and addresses their concerns," Lied continues.

Another sign that you've got someone special on board is by measuring their progress. McKinley says an employee's progress is an accurate indicator of his or her potential.

"We're always evaluating people around us, even if it's in a subconscious way," says McKinley. "As supervisors, there are things that really turn us off, like a kid standing around leaning on his shovel all day. Ask yourself, 'Are these people better employees than they were two weeks ago? What have they done that's special? What have they done to help me make money?'"

Lied adds that the industry could employ more women by restructuring workloads so women can cope with more of it.

"It's not sexist to say that a woman, generally speaking, is not as physically strong as a man, and probably doesn't have the endurance or stamina a man has for some very heavy work," says Lied. "By the same token, she tends to be more meticulous, faster, and more complete in work that involves manual dexterity, quickness, tidiness and foresight." Lied says by adjusting jobs to enable them to do more work, by using equipment tailored to make the job easier, or by giving them director-level positions, more women can contribute to the industry.

"Take a look at your job flow charts," adds Lied. "You'll probably find that jobs can be broken out into patterns so that a person with less physical strength can still be a part of the team."

McKinley: Reward doesn't necessarily mean a huge monetary effort. Try a special gift as incentive.

What to pay?

Light compensation for field level employees is a given in the green industry. But educators and enlightened managers realize that employees who demonstrate enthusiasm and aptitude for landscaping deserve a little more.

"We get calls from people who think that since they're providing such an outstanding educational opportunity to the student that they don't think they have to pay them very much. That's just not the case," says Tom Voigt, assistant professor of agronomy at the University of Illinois in Urbana. "They don't have to get what an experienced, full time employee receives, but like anyone else they respond better to a job they're compensated fairly for."

Money as motivation

Lied suggests landscape managers remember that students are working for one reason: to earn money, usually for college. They're interested in a job they can feel good about, while enjoying the highest level of earning capacity, he says. Consequently, overtime is often desired.

But there are a lot of other, more creative ways to reward an employee for a job well done. McKinley suggests giving them the unexpected. It might be as simple as a supervisor taking the time to pull an employee aside and say, "nice job."

"Or better yet, write them a note and send it to their home," says McKinley. "Nobody gets letters like that. It's as easy as 'Dear John, thanks for the good work.' You'll blow people's eyes out!"

McKinley concludes by reminding landscapers that employee turnover is part of the nature of the business. "You're going to have people move on, and I say that's great. Isn't it something when a college student works for you, earns money, goes to college, and is now out there fulfilling their destiny? You can be an important part of these people's lives." **LM**

Employees who demonstrate a special interest in landsaping operations benefit from working with a mentor who can educate them as well.

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DISEASES OF TURFGRASSES

Old reliable disease control methods—resistant species, culture and chemistry— are joined by the new kids on the block, bio-rational controls.

by Peter Landschoot, Ph.D., Pennsylvania State University

Diseases continue to be limiting factors in successfully managing quality turf. Despite the best efforts of plant pathologists, turfgrass breeders and vigilant turf managers, large numbers of lawns and golf courses are damaged by diseases each year.

While the pathogens which cause these diseases cannot be eliminated from turf, in many cases it is possible to manage them to tolerable levels. This, however, requires an understanding of the plants as well as the pathogens which parasitize them.

The first step in managing a turfgrass disease is to obtain an accurate diagnosis. While this is a straightforward task with turfgrass pests that are relatively easy to observe (weeds and insects), the pathogens which cause turf diseases are usually only visible under a microscope.

Occasionally, turfgrass pathogens produce large fruiting structures (mushrooms for example), or massive amounts of spores and mycelium which can be seen without a microscope. More often, symptoms (the expression of the plant to the disease) are used as diagnostic features.

Symptoms of turfgrass diseases can take on a variety of sizes, shapes, and colors. On individual plants they may appear as small, circular, tan-colored lesions surrounded by brown or purple halos on leaves; as a yellowing of the entire leaf blade; or as a brown or black rot of the crowns and roots. Symptoms can also be observed on populations of plants. They may take the form of circular patches, rings, or irregular areas of blighted turf.

Symptoms of leafspot on Kentucky bluegrass. Note the dark brown halos encircling the lesions. Photo courtesy of N. Jackson.

Once an accurate diagnosis has been made, the next step is to devise a control strategy. Traditionally, disease control strategies have been grouped into four categories: cultural control; chemical control; disease-resistant species and varieties; and the newest category, bio-rationals (biological control).

Cultural controls

Cultural control measures should be the first line of defense against turf diseases. They are geared toward modifying the environment of the turfgrass stand. Cultural practices which play a role in the development of turf diseases include mowing, fertilization, liming or acidifying the soil, irrigation, thatch removal, aerification, and any other practice which modifies the turf environment.

Mowing practices have a strong influence on turfgrass diseases. Every time a mower removes leaf tissue, a wound is created through which a pathogen may enter the plant. Also, guttation fluids can accumulate at the cut leaf tip and provide a food source for some pathogens. In some cases, mowers may actually spread the pathogen from one location to another.

Mowing below the height at which the turfgrass species is best adapted can place stress on the grass and make it more susceptible to some diseases (especially during the summer months). To reduce the potential for increased disease injury, mow at the height recommended for the species

IPM: A CONCEPT FOR DISEASE MANAGEMENT

Integrated pest management (IPM) can be defined as using all available tools, including cultural practices, pesticides, resistant species and varieties, and bio-rationals, to manage pests below an economic or aesthetic threshold level.

A well-planned and executed IPM program should result in suppressing the target pest with minimal impact on non-target organisms and the environment.

An IPM program for managing turfgrass diseases begins by accurately identifying the disease. If the signs and symptoms cannot be distinguished by casual observation, a sample should be submitted to a diagnostic lab for positive identification. Some turfgrass managers have purchased microscopes to improve the precision of disease diagnosis while others have used antibody-based diagnostic kits for identifying some foliar diseases (see Shane, LANDSCAPE MANAGEMENT, June 1989).

Once the disease has been diagnosed, an economic or aesthetic threshold of disease injury should be established. The threshold level is the point at which further disease injury cannot be tolerated. Once this level have been reached or exceeded, control measures are warranted.

Threshold levels will vary depending on how the turf is used (golf course greens, for example, will be adversely affected by even a small amount of disease damage while considerably more disease injury can be tolerated on low maintenance turf). The site should be monitored on a regular basis to determine when the threshold level is reached.

The coordination of several management practices determines the success of an IPM program. These practices must be compatible with a sound turf management program and be practical as well as cost effective. IPM will undoubtedly become increasingly important in the future as more restrictions are placed on the use of pesticides. By adapting the IPM concept now, the effective management of turf diseases will be an easier task in the future.

—Dr. Landschoot□

you are attempting to manage. Also, maintain a sharp cutting blade to prevent leaf tissue from tearing and shredding, and refrain from mowing when the turf is under heat or drought stress.

Fertilization is an important factor in the development of turfgrass diseases.

Some pathogens favor lush, succulent leaf growth that may occur as the result of heavy applications of nitrogen fertilizer. Diseases that are favored by excessive applications of nitrogen fertilizer include leaf spot, brown patch, pythium blight, stripe smut, and the snow mold diseases.

Certain diseases are more prevalent under low fertility. Nitrogen-deficient turfgrass plants are more susceptible to dollar spot, red thread, pink patch, and the rust diseases.

The soil pH has an important role in managing at least two diseases: microdochium (fusarium) patch and take-all patch. Both diseases are serious problems on golf course turf that tend to be favored by a high pH (7.0 or above). Studies have shown that applying acidifying fertilizers (such as ammonium sulfate and ammonium chloride) or sulfur can lower the pH of the soil and suppress these diseases. This is especially important for take-all patch since it is not readily controlled by fungicides.

While irrigation is essential during the summer to prevent drought damage, it can also contribute to disease problems. Most fungal pathogens require free water to initiate the infection process. Watering at night should be avoided since it leaves a film of water on the plants for an extended period of time. Watering should be performed early in the morning during periods of disease activity.

Thatch is the tightly-bound layer of dead and living stems and roots that develops between the zone of green vegetation and the soil surface. A moderate amount of thatch can insulate the turf canopy from the soil and provide resiliency on sports turf. Too much thatch can prevent wetting of the soil and result in drought-stressed turf which is more susceptible to some diseases.

Thatch can also provide a habitat for disease organisms and bind pesticides before they reach the target pathogen. A regular thatch reduction program is essential to manage diseases.

Soil physical properties can greatly affect the health and performance of turfgrasses. Soil compaction leads to poor infiltration and reduced oxygen diffusion into the root zone. Some root and crown diseases such as summer patch and anthracnose are frequently associated with compacted and poorly-drained soils on putting greens.

Aerifying compacted and wet soils allows improved rooting, thus, increased resistance to root diseases.

Chemical control of turfgrass diseases is usually accomplished by using fungicides. Turf fungicides can be divided into two broad categories: (1) contact fungicides and (2) systemic fungicides (Table 2).

White mycelium on turf in the early morning is a sign of the pathogen which causes dollar spot disease (*Sclerotinia homoeocarpa*).

Chemical controls

Contact fungicides are generally applied to the leaf and stem surfaces of turfgrasses. They do not move appreciably within the plants. Hence, these materials may be washed or mowed off the plant surfaces. Consequently, they are only effective for short durations (usually 7 to 14 days) and do not protect new foliage. These fungicides are usually used to control foliar diseases and not root/crown diseases. As a group, contact fungicides, with a broad spectrum of control, have been used extensively in the turf industry for a number of years.

see disease on page 34

TABLE 1.
DIAGNOSTIC FEATURES ON SOME COMMON TURFGRASS DISEASES.

DISEASE	CAUSAL AGENT(S)	SYMPTOMS/SIGNS	SUSCEPTIBLE GRASSES
Anthracnose	Colletotrichum graminicola	Yellowing of leaf blades associated with a black crown rot. Pin cushion-like fruiting bodies with small, spiney projections can be seen with a hand lense.	Annual bluegrass, bentgrasses, and fine fescues.
Brown patch	Rhizoctonia solani	Large, circular brown patches or thinning of turf. On low-cut turf, patches often surrounded by dark rings. White, cottony mycelium may be present on high-cut turf in early morning.	Bentgrasses, ryegrass, tall fescue, St. Augustinegrass, and zoysiagrass.
Dollar spot	Lanzia spp. Moellerodiscus spp. (sclerotinia homeocarpa)	Small, bleached patches of dead grass appear in turf. Lesions on leaves are white, often with brown borders. White, cottony mycelium may be present on dew-covered turf in early morning.	All cool- and warm-season turfgrasses.
Fairy ring	Basidiomycete fungi	Dark-green rings become apparent in mature turf. Mushrooms often present around periphery of ring.	All cool and warm season turfgrasses.
Gray leaf spot	Pyricularia grisea	Oblong leaf spots that are brown or tan in the center with purple or brown halos. Severely affected plants appear scorched.	St. Augustinegrass
Leaf spot/melting out	Drechslera and Bipolaris spp.	Small tan lesions with purple or brown borders on leaf blades. In severe cases, the crowns are rotted and the turf may be significantly thinned.	Primarily Kentucky bluegrass. Other cool- and warm-season grasses may be affected.
Necrotic ring spot	Leptosphaeria korrae	Large ring-shaped patches, usually creating depressions in turf. Roots and crowns show brown or black rot.	Primarily Kentucky bluegrass. In some cases, fine fescues and annual bluegrass.
Powdery mildew	Erysiphe graminis	White, fluffy mycelium on leaf blades, usually present on turf growing in shaded areas.	Kentucky bluegrass and Bermudagrass.
Pythium blight	Pythium aphanidermatum & other Pythium spp.	Irregular patches of blighted turf. White, dense, cottony mycelium growing in turf in morning.	Perennial ryegrass, bentgrasses, tall fescue.
Red thread/ Pink patch	Laetisaria fuciformis/ Limonomyces roseipellis	Small red to pink patches of blighted turf. Long, slender threads of red mycelium (red thread), or fluffy, pink mycelium (pink patch) growing out of foliage.	Fine fescues, perennial ryegrass, Kentucky bluegrass.
Rust	Puccinia spp.	Yellowing of leaves often apparent. Brown pustules occurring on leaves and stems.	Tall fescue, perennial ryegrass, Kentucky bluegrass, zoysiagrass, and bermudagrass.
Slime molds	Myxomycetes	Blue or tan-colored spore-like structures on leaves.	All cool- and warm-season turfgrasses.
Snow mold (gray)	Typhula incarnata	Large patches of matted turf appearing at snow melt. Gray mycelium and orange resting structures often present on affected foliage.	All cool-season turfgrasses.
Snow mold (pink)	Microdochium nivale	Small patches of matted turf with pink or reddish color on the leaves.	All cool-season turfgrasses.
Spring dead spot	Leptosphaeria korrae, Ophiosphaerella herpotricha, or Gaeumannomyces graminis.	Large ring-shaped patches, often creating depressions in turf. Roots, crown and stolons show brown or black rot.	Bermudagrass
Stripe smut	Ustilago striiformis	Black streaks of spores along length of leaf blades. Shredding of leaf blades.	Kentucky bluegrass and bentgrass.
Summer patch	Magnaporthe poae	Large yellow or tan ring-shaped patches. A root and crown rot is usually apparent.	Bluegrasses and fine fescues.

Source: Dr. Landschoot

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TABLE 2.

GENERIC & TRADE NAMES OF THE COMMON TURFGRASS FUNGICIDES

GENERIC NAMES	CONTACT (C) OR SYSTEMIC (S)	COMMON TRADE NAMES[1]
Anilazine	C	Dyrene
Benomyl	S	Tersan 1991, Lesco Benomyl, Lebanon Benomyl
Cadmium chloride	C	Caddy
Cadmium sebacate + thiram + potassium chromate	C + C	Kromad
Cadmium succinate	C	Cadminate
Chloroneb	C	Tersan SP, Teremec SP, Proturf Fungicide II
Chlorothalonil	C	Daconil 2787
Ethazol (etridiazole)	C	Koban, Terrazole
Fenarimol	S	Rubigan
Fosetyl-Al	S	Aliette
Iprodione	S	Chipco 26019, Proturf Fungicide VI
Mancozeb	C	Fore, Formec, Dithane F-45, Lesco Mancozeb, Manzate 200 DF
Maneb	C	Dithane M-22
Maneb + zinc sulfate	C + C	Tersan LSR, Dithane M-22 w/Zinc, Lesco 4 F w/Zinc
Mercury chloride	C	Calo-Clor, Calo-Gran
Metalaxyl	S	Subdue, Proturf Pythium Control
Metalaxyl + mancozeb	S + C	Pace
Pentachloronitrobenzene (quintozene)	C	Terraclor, Turfcide, Proturf FF II, Lesco PCNB
Phenylmercuric acetate	C	PMAS
Phenylmercuric acetate + thiram	C + C	Proturf Broad Spectrum Fungicide
Propamocarb	S	Banol
Propiconazole	S	Banner
Thiophanate-ethyl + thiram	S + C	Bromosan
Thiophanate-methyl	S	Fungo 50, Spot-Kleen, Clearys 3336, Topsin M, Proturf Systemic Flugicide
Thiophanate-methyl + mancozeb	S + C	Duosan
Thiophanate-methyl + iprodione	S + S	Proturf Fluid Fungicide
Thiram	C	Tersan 75, Spotrete, Thiramad, Lesco Thiram
Triadimefon	S	Bayleton, Proturf Fungicide VII, Lebanon Turf Fungicide
Triadimefol + metalaxyl	S + S	Proturf Fluid Fungicide II
Triadimefon + thiram	S + C	Proturf Fluid Fungicide III
Vinclozolin	S	Vorlan
Zineb	C	Zineb

[1]Products may be available only through specialized dealers or only in large quantity. Some products can be purchased and applied only by licensed pesticide applicators. This list is presented for information only. No endorsement is intended for products mentioned, or is criticism meant for products not mentioned.

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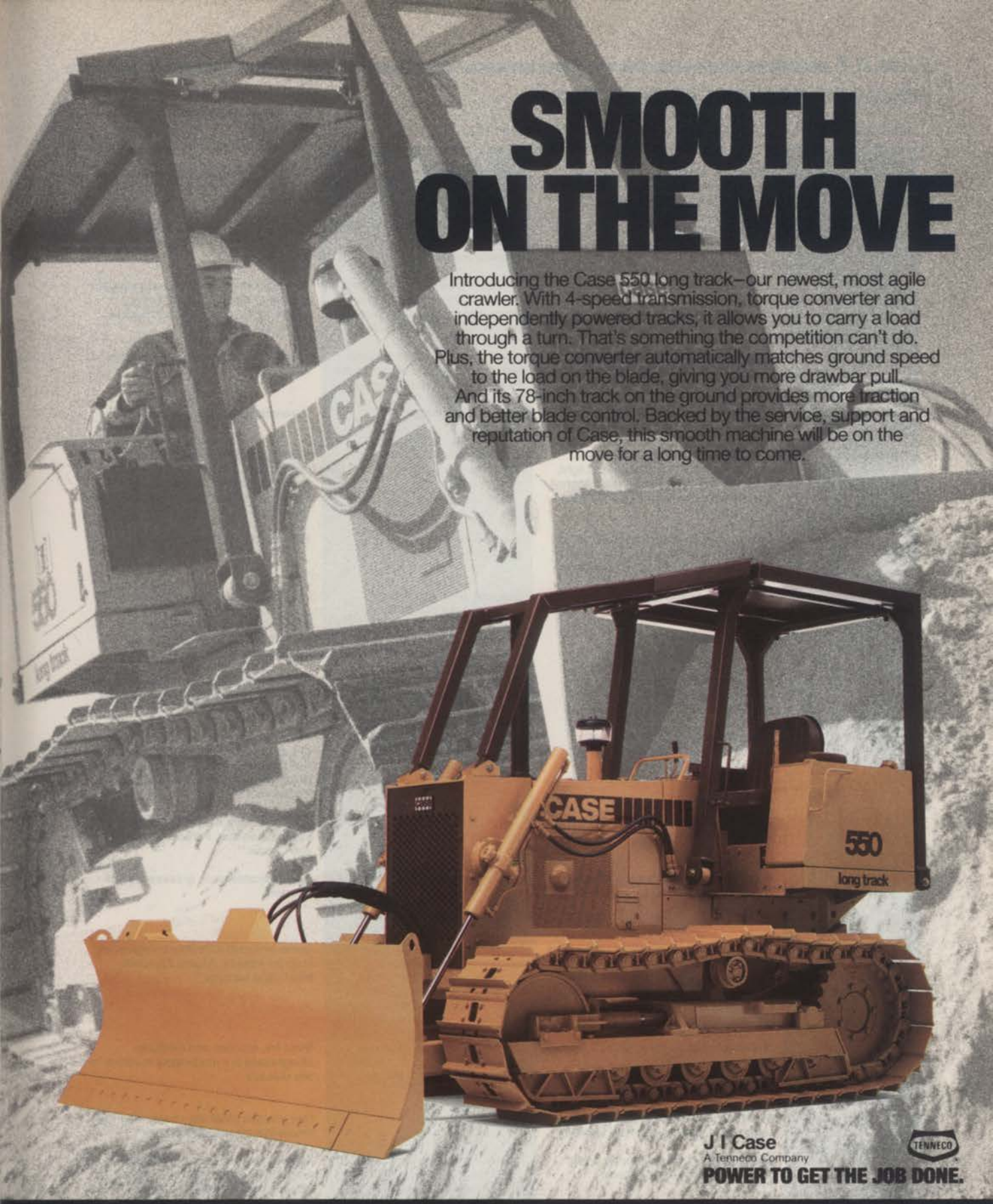

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TABLE 3.
METHODS OF DISEASE CONTROL

DISEASE	CULTURAL	CHEMICAL	RESISTANT SPECIES/ VARIETIES
Anthracnose	Fertilize to maintain vigor, improve drainage, verify, and raise mowing height during periods of heat stress.	benomyl, chlorothalonil, mancozeb propiconazole, triadimefon	Bentgrasses are less susceptible than annual bluegrass on putting greens.
Brown patch	Avoid excess N in summer, increase air circulation, avoid excessive watering.	anilazine, benomyl, chlorothalonil iprodione, manocozeb, maneb thiophanates, thiram, vinclozolin	Kentucky bluegrasses are less susceptible to brown patch than other turfgrasses.
Dollar spot	Avoid N deficiency, maintain good soil moisture, remove guttation and dew from leaf surfaces, avoid night watering.	anilazine, benomyl*, cadmium* chlorothalonil, fenarimol, iprodione mancozeb, propiconazole thiophanates, thiram, vinclozolin	Resistant Kentucky bluegrass varieties include Adelphi, America, Aspen, Challenger, Eclipse, Escort, Nassau, Somerset, & Wabash.**
Fairy ring	Use clean fill during establishment, improve water infitration, or mask symptoms with N-fertilizer or iron.	None effective, must fumigante with soil sterilant to eradicate the fungus (this will also kill grass).	No resistant species or varieties are available.
Grey leaf spot	Avoid excessive N fertilization and overwatering	chlorothalonil thiram	Perennial ryegrass is resistant.
Leaf spot/melting out	Avoid excess N applications in early spring, mow≥2″ in height, avoid light, frequent irrigation. Do not use benomyl, thiophanates, or triadimefon to control this disease.	anilazine, chlorothalonil, iprodione maneb, mancozeb, vinclozolin	Resistant Kentucky bluegrasses include: Adelphi, Bristol, Destiny, Eclipse, Enmundi, Glade, Ikone, Leberty, Majestic, Mona, P-104, Rugby, and Somerset.**
Necrotic ring spot	Manage turf for maximum root growth, irrigate to maintain good soil moisture, maintain mowing height at 2″ or above.	benomyl, fenarimol, propiconazole	Perennial ryegrasses are resistant.
Powdery mildew	Reduce shade and improve air circulation.	benomyl, fenarimol, propiconazole triadimefon	Use grasses adapted to shaded areas such as fine fescues and rough bluegrass. Resistant Kentucky bluegrasses include: A-34, Glade, Touchdown, & Eclipse.**
Pythium blight	Improve drainage, increase air circulation, avoid excess N, reduce irrigation.	chloroneb, etridiazole, metalaxyl* phosethyl, Al propamocarb	Kentucky bluegrass is less likely to be damaged by Pythium blight than other turfgrasses.
Red thread/ pink patch	Maintain adequate fertility of turf (especially N), remove and destroy clippings.	alilazine, benomyl***, cadmium chlorothalonil, iprodione propiconazole, thiophanates*** triadimefon, vinclozolin	Resistant perennial ryegrasss include: Allaire, Commander, Delray, Manhatten II, Palmer, Pennant, Prelude, Regal, Regency, SR 4000, SR 4100, and Yorktown II.**
Rust diseases	Avoid N-deficiency and drought-stress (especially in late summer/early fall)	maneb, mancozeb, fenarimol propiconazole, triadimefon	Some resistant Kentucky bluegrasses include: Kenblue, Parade, Rugby, A-34, and Classic**.
Slime molds	Remove spores by spraying water on leaves or brushing turf.	None required.	Not applicable since grasses are not infected.
Snow molds:			
Gray snow mold	Avoid excess N in fall before grass goes dormant, mow until top growth ceases in fall, prevent accumulation of snow in sensitive areas, rake up mats (patches) in spring to speed recovery.	Fungicides should be applied in late fall before snow cover. cadmium chloroneb fenarimol iprodione mercury fungicides PCNB thiophanates thiram triadimefon vinclozolin	Some resistant Kentucky bluegrasses include: Adelphi, Aspen, Enmundi, Plush, and Vantage**.
Pink snow mold	(Same as for gray snow mold)	benomyl, fenarimol, iprodione mancozeb, mercury, fungicides PCNB, thiophanates, thiram vinclozolin	Most fine fescues and Kentucky bluegrasses are moderately resistant to this disease.
Spring dead spot	Avoid low mowing heights, thatch, compaction, and excessive N fertility.	benomyl, fenarimol, propiconazole	Use grasses other than bermudagrass where this disease is a problem.
Stripe smut	Avoid excess N in early spring, avoid drought stress in early summer.	Apply fungicides in early spring or late fall, water-in for good root uptake. Benomyl, fenarimol propiconazole, thiophanates triadimefon	Ryegrasses, tall fescues, and the fine fescues are less susceptible to this disease than Kentucky bluegrass.
Summer patch	Avoid low mowing heights, reduce compaction, avoid overwatering in summer, and improve drainage.	benomyl, fenarimol, propiconazole thiophanates, triadimefon	Resistant Kentucky bluegrasses include Adelphi, Enmundi, Sydsport, and Touchdown.

* Resistance has been recorded.
** Based on National Turfgrass Evaluation Program and Penn State data. No endorsement of cultivars is intended for those mentioned, or is criticism meant for cultivars not mentioned. *** Controls red thread and not pink patch.

Source: Dr. Landschoot

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for a number of years.

Systemic fungicides are a newer group of chemicals which are absorbed and translocated within the plant. Thus, they are not as likely to be removed from the plant by rainfall and mowing. Systemics may protect the plants for a period of two to four weeks and will protect new growth.

Most systemic fungicides will control both foliar and root/crown pathogens. When attempting to control root/crown pathogens, systemic compounds should be watered into the rootzone for maximum effectiveness.

In general, systemic fungicides tend to have a specific mode of action, thus, they do not have as broad of a spectrum of control as contact fungicides.

Although fungicides are an effective management tool for many turf diseases, they have some drawbacks as well. In some cases, certain fungicides have been shown to promote turf diseases. One notable example involves an increase in leaf spot severity when benomyl or triadimefon is used.

Another potential problem associated with fungicide use is fungicide resistance. Fungi can become tolerant to fungicides when used in succession for long periods. Thus far, resistance has occurred in populations of several common turfgrass pathogens.

To prevent resistance from occurring, fungicides should be periodically alternated or used in mixtures with compounds possessing different modes of action.

Perhaps the primary reason for fungicide failure, however, is using the wrong fungicide because of a misdiagnosed disease.

Species selection

The third means of managing turfgrass diseases is by using disease-resistant species and varieties. While turfgrass breeders have made tremendous strides in developing grasses with improved disease resistance, no turfgrass is resistant to all diseases.

One way to increase the overall resistance of the turf stand is to plant mixtures of different grass species and/or blends of cultivars of an individual species. If one cultivar or species is damaged by a disease, the others will hopefully fill the voids left by its demise.

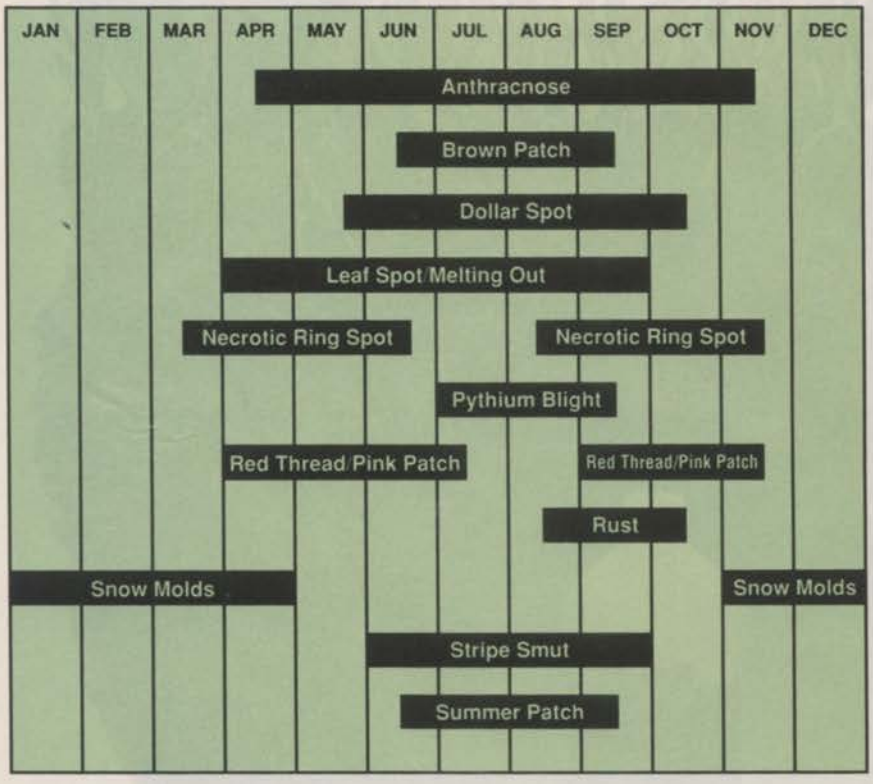
Bio-rational control

Using bio-rationals for controlling turfgrass diseases is relatively new. The most active area of research involves using organic fertilizers for disease suppression.

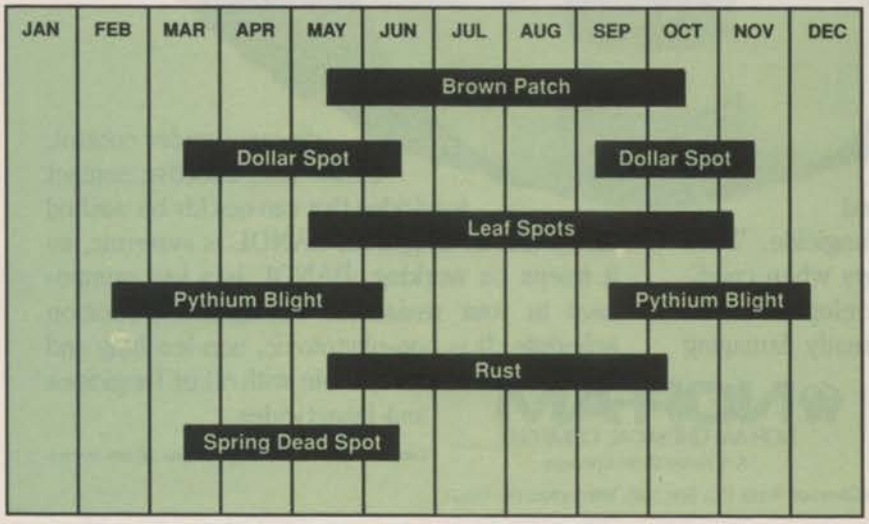
These products are thought to stimulate the development of microorganisms which antagonize turfgrass pathogens. Studies in some areas of the country have shown success with these compounds; however, further testing is required to substantiate their value in the consistent control of turfgrass diseases. **LM**

CALENDAR

COMMON DISEASES OF COOL-SEASON TURF



COMMON DISEASES OF WARM-SEASON TURF



Dr. Peter Landschoot is assistant professor of turfgrass science at Penn State University.

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COOL-SEASON INSECT CONTROL GUIDE

New application methods and materials will soon result in more effective insect control. Our annual guide helps you time your treatments.

by Harry Niemczyk, Ph.D., Ohio State University

During the past year, the Turfgrass Pesticide Laboratory at the Ohio Agricultural Research and Development Center, Ohio State University, Wooster, Ohio, conducted research that further demonstrated the benefits of turfgrass to our environment.

Researchers found that insecticides applied to turfgrasses with or without thatch showed little or no potential for leaching into the underlying soil.

The studies, based on 1988 and 1989 field applications of the preemergent herbicides pendimethalin, bensulide, benefin, trifluralin and oxadiazon, has shown no residues at the 10-inch soil level.

Excitement is also brewing about methods of placing insect control ma-

SPRING
(April-May)

Chinch bugs and billbugs— As the warm days of spring approach, movement of chinch bug and adult billbugs increases rapidly. Generally, egg laying begins the first week of May, but can begin in mid-April if spring arrives early. Occasionally adult billbugs can be seen on sidewalks on warm April afternoons.

Generally, application of insecticides to prevent infestations of chinch bugs and billbugs should be completed by the first week in May. Applications may begin as early as the last week of March. Such applications must be made before significant numbers of eggs are laid. This time may vary as much as a week or more, depending on spring weather.

Grubs— Overwintered grubs return to the surface and begin feeding on turfgrass roots in April. Increased activity and damage from birds, moles, skunks and raccoons foraging on grubs can also be expected and continues through May.

Treatment should be delayed until the grubs are in the top one inch of soil. Irrigation or rainfall should follow such applications to aid in moving the insecticides to the target grub as soon as possible following application.

Although milky disease products for control of Japanese beetle grubs may be applied any time there is no frost in the soil, spring is a good time for such applications. The soil is open and frequent rains move the disease spores into the soil and thatch.

Milky disease products are primarily effective against Japanese beetle larvae. Ineffectivity against other species is low.

Incidents of large grub infestations (June bug larvae, for example) have been increasing in cool-season areas. Locations of such infestations should be identified because reinfestation is likely every three years.

Eggs are laid in May and June, therefore treatment should be made in late summer, early fall of that year or the next spring while larvae are small. Later applications against full-grown larvae have given inadequate control in past studies.

Black turfgrass ataenius— Adults of the black turfgrass ataenius can be seen "at wing" in April and are often found in clipping catchers after early mowing of golf course greens. These adults begin laying eggs in early May, or about the time *Vanhoutte spirea* first comes into bloom. Dursban applied to a fairway at this time kills adults and prevents summer infestation of larvae. Check with local extension entomologists for the precise time if needed.

A second application, two weeks after the first, may be needed to successfully prevent infestation.

Sod webworms— Overwintered larvae of the sod webworm begin feeding as soon as the grass begins to grow. Usually damage is insignificant but areas that do not green up may be infested. These areas frequently have probe holes from starlings feeding on larvae.

Moth flights begin in May in northern areas. Young larvae are usually present about two weeks after the spring moth flight peaks, so treatment of young larvae can be done in May in some areas.

Cutworms— Moths of cutworms begin laying eggs

continued on page 46

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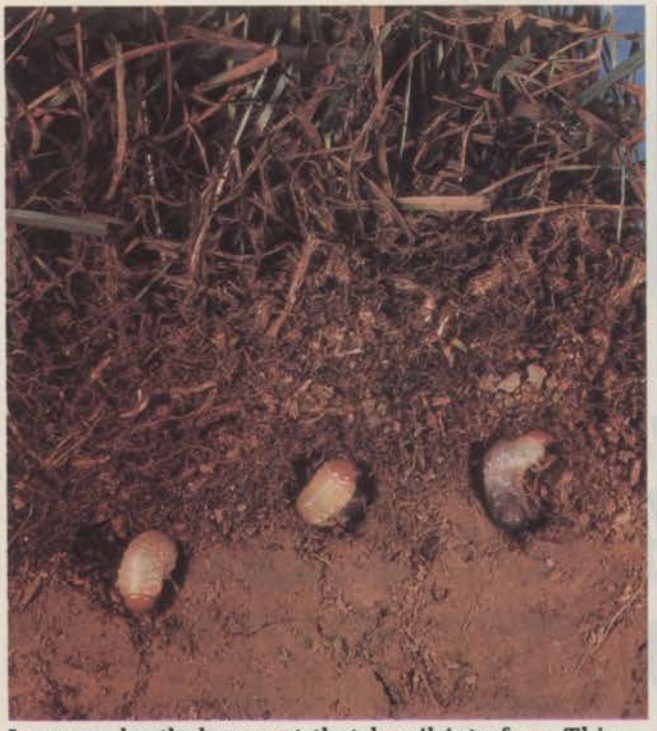

Japanese beetle larvae at thatch-soil interface. This year's early spring will bring grub to the surface earlier. Watch for skunks and raccoons, which can damage turf when searching for them.

SPRING *from page 44*

on golf course greens and other turf areas in the spring. These eggs hatch, producing larvae that feed on grass blades during the night. The black cutworm is the most common species on cool-season turf.

While visible damage is uncommon on home lawns, damage can be significant on golf course greens in late May.

Greenbug— Greenbug eggs begin hatching as early as April, but significant infestations do not develop until later in the year.

Greenbugs are also brought into the region from the south on upper air winds. Aphid numbers are too low to detect in lawns at this time.

Winter grain mite— Damage from this mite is often first noted in March or April when turf areas are receiving spring fertilizer applications. Winter grain mites are identifiable by eight bright red legs and a dark body.

By late May, the mites will have laid their eggs and died. Mites do not appear again until the eggs hatch in October.

Clover mites— Incidents of visible damage to home lawns are often seen in April in several Ohio cities and Denver. Usually a nuisance pest in and around homes, the clover mite occurs in large numbers (5,000 per square foot) across entire lawns and on turf next to building foundations. Symptoms of injury were the same as the winter grain mite. Turf next to foundations may be killed.

The clover mite has a slightly pink body and eight pale-colored legs. The first pair of legs is extremely long and protrude well out in front of the mite. The absence of bright red legs distinguishes the clover mite from the winter grain mite.

SUMMER
(June-July)

Chinch bugs— Chinch bug eggs continue to hatch into June. Bright red nymphs with a center white band appear. The number of chinch bugs increases rapidly in June. Their populations peak in July and August, when northern lawns can receive severe damage. This damage is often masked by summer dormancy of turf caused by drought. Hot, dry conditions are ideal for chinch bugs.

During August the nymphs molt into adults that mate and lay eggs, thus producing a second generation. Some northern areas have only one generation per year.

Billbugs— Bluegrass billbug larvae feed on grass stems during June and move to the plant crowns, roots and rhizomes during July. This feeding pattern causes brown spots that frequently resemble the symptoms of some fungus diseases. Symptoms are also often masked when the turf is dormant from drought.

The larvae usually move deeper into the soil under dry soil conditions. During late July and August the larvae burrow deeper into the soil to pupate and transform into adults.

Grubs— By June, grubs have stopped feeding and are in the pupal stage, three to four inches in the soil. Beginning mid-June and continuing through mid-July, the adults of various species emerge and burrow into the soil to lay eggs. Hatching and appearance of young larvae occur during July and August.

Extreme heat and drought during the summer may cause some grubs to move deeper in the soil. Under such conditions, irrigation several hours before treatment and a thorough soaking afterward is adviseable.

Black turfgrass ataenius— Eggs laid by beetles during May hatch in June and the larvae immediately begin feeding on turf roots and thatch.

From late June to mid-July, symptoms of injury include wilting in spite of irrigation. In July, larvae move deep into the soil, pupate and emerge as adults. These adults lay eggs during August, producing a second generation in some states. The second generation larvae are capable of damaging turf. States farther north have only one generation.

Sod webworms— Damage from sod webworm larvae occurs occasionally in most of the cool-season turf region. Injury is more common in Midwestern states, usually in July and August. Older sod fields or areas with heavy thatch are good candidates for infestation. There are generally one or two generations per year, depending on the species.

Cutworms— Cutworm larvae continue to cause damage to golf course greens from June through August. These larvae pupate in the soil or thatch and emerge as moths that lay eggs for additional generations.

Fall armyworm— The fall armyworm is seldom a problem of cool-season turf.

Greenbug—Damaging populations of greenbugs can occur from June through August. Populations and incidents of damage frequently vary from area to area, even within the same city.

Symptoms of injury include turf under the dripline of trees and in open areas having a burnt orange color. When symptoms are apparent, numerous aphids (40 or more) may be seen on a single grass blade. Close examination of damaged turf is necessary because the aphids are small. If left untreated, a heavy infestation can kill the turf.

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Cynthia Harper
Color Burst, Atlanta, Ga.

Ritz-Carlton, Buckhead
Atlanta, Georgia

terials, such as insecticides or nematicides, biological control agents, entomogenous nematodes, insect growth regulators (IGRs), milky disease and others, right where the pest is, without leaving residues on the surface. This approach will reduce the application rate necessary for control since placement is directly in the zone of pest habitation. Another significant advantage of this method is that the potential for pesticide runoff will be significantly reduced, if not eliminated.

The equipment needed for subsurface placement of granular products on golf courses is already available and will be tested in 1990. Equipment now used for subsurface placement of liquid polymers has adapted for application of liquid

FALL
(Sept.-Oct.)

Chinch bugs—In the northern U.S. the second generation of chinch bug is at peak numbers in September. Nymphs complete their development to adults in late October. Most chinch bugs overwinter in the turf, but some move to protected areas before winter.

Generally, infestation levels at this time are not high enough to warrant the use of insecticides. Early fall rains and infection by a parasitic fungus (*Beauveria app.*) usually provide sufficient control.

Billbugs— During September, billbug adults that developed from summer larvae are often seen on sidewalks, driveways, or other paved surfaces. Before winter, these adults seek shelter in thatch, along sidewalk edges or near foundations and overwinter. Many, if not most, overwinter in turf.

In some areas a partial second generation may occur. Larvae of this generation have been know to cause visible damage in September and October.

Grubs— Most species of grubs are in the third of their three stages of development and are feeding actively. When soil temperatures decrease in late October, the larvae burrow deeper into the soil to overwinter. If soil temperatures remain warm, larvae stay at the surface and continue feeding. Severely cold winters have little effect on survival.

Black turfgrass ataenius— By September, adults of the current generation begin to fly into protected areas, such as golf course roughs, to overwinter. Larvae that have not completed development to adults before the first frost are killed.

Sod webworm— Northern sod webworm larvae are small and cause little if any damage in the fall. Late in the fall the larvae construct a cocoon-like shelter in which they overwinter.

Greenbug— Severe infestations of greenbug have been known to occur as late as the first week of December. Areas having a history of infestation should be re-examined when mild temperatures extend late into fall. Heavily-infested turf will not survive through winter.

Japanese beetle larvae infected with milky disease (top), and a healthy grub. Subsurface placement of milky disease products should significantly increase their effectiveness (*Photo courtesy Dr. M. Klein, USDA-ARS*).

LATE WINTER
(Nov.-Dec.)

Chinch bugs and billbugs— In northern zones, chinch bugs and billbugs overwinter as adults in thatch or sheltered sites near buildings. They can become active during warm days in March. Infestations of hairy chinch bugs and bluegrass billbugs also occur in zoysia, Kentucky bluegrass and fine fescues.

Grubs—The larvae of this group of pests normally overwinter six inches or deeper in the soil. If spring comes early, grub activity can be expected along with skunks and raccoons, which tear up the turf in search of them. Moles, which feed on grubs and earthworms, also become active at this time.

Black turfgrass ataenius—This golf course pest overwinters as an adult in the soil under debris in roughs or other protected areas. A few may be seen flying about on warm afternoons in early March. Usually this activity begins when crocus starts blooming and intensifies as the bloom of red bud appears.

Greenbug— The only stage of the greenbug known to overwinter in northern states is the egg. Shiny black eggs deposited the previous fall may be found adhering to grass blades, fallen tree leaves or other debris.

Sod webworms— The most common sod webworm species overwinter as larvae in the thatch or upper inch of soil. Feeding does not resume until hibernation (dipause) is broken by early spring warmth. **LM**

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and biological control materials. More walk-behind units for both liquid and granular products are being manufactured or are on the engineer's drawing board.

At OARDC, excitement is mounting about the materials we have to evaluate in 1990.

Being able to track a pests' life cycle is still at least as important as selecting an insecticide for their control. This guide points out the seasonal occurence of some important cool-season pests to be on the lookout for this year. Best control will come when you apply insecticides during the pest's most vulnerable stages, which are outlined here. No endorsement of products is intended, nor is criticism implied of those not mentioned.

HOW'S YOUR KNOWLEDGE OF TURF INSECTS?

Test Yourself or Your Crew

1. Bluegrass billbugs overwinter as _____.

adults	pupae
larvae	eggs

2. A pesticide with an LD_{50} of 75 is safer than one with an LD_{50} of 1000.

_____ True
_____ False

3. Sod webworms generally overwinter as _____.

adults	pupae
larvae	eggs

4. _____ percent of all insects are considered pests.

Less than 1%	5%
1%	10%

5. The reason for poor grub control with pesticides is _____.

resistance
too much rain
insecticide did not reach pest
UV breakdown

6. The Japanese beetle overwinters as _____.

egg	pupae
larvae	adults

7. Grubs eat _____.

thatch	soil
grass roots	thatch, soil and roots

8. Dursban is an _____.

organophosphate	pyrethroid
carbamate	chlorinated hydrocarbon

9. Masked chafer adults fly _____.

during the daytime	at mid-day
early morning	at night

10. Match these raster drawings with the following insects:

a. Black Turfgrass Ataenius
b. European Chafer
c. Masked Chafer
d. May-June Beetle
e. Japanese Beetle

11. _____ 12. _____ 13. _____

14. _____ 15. _____

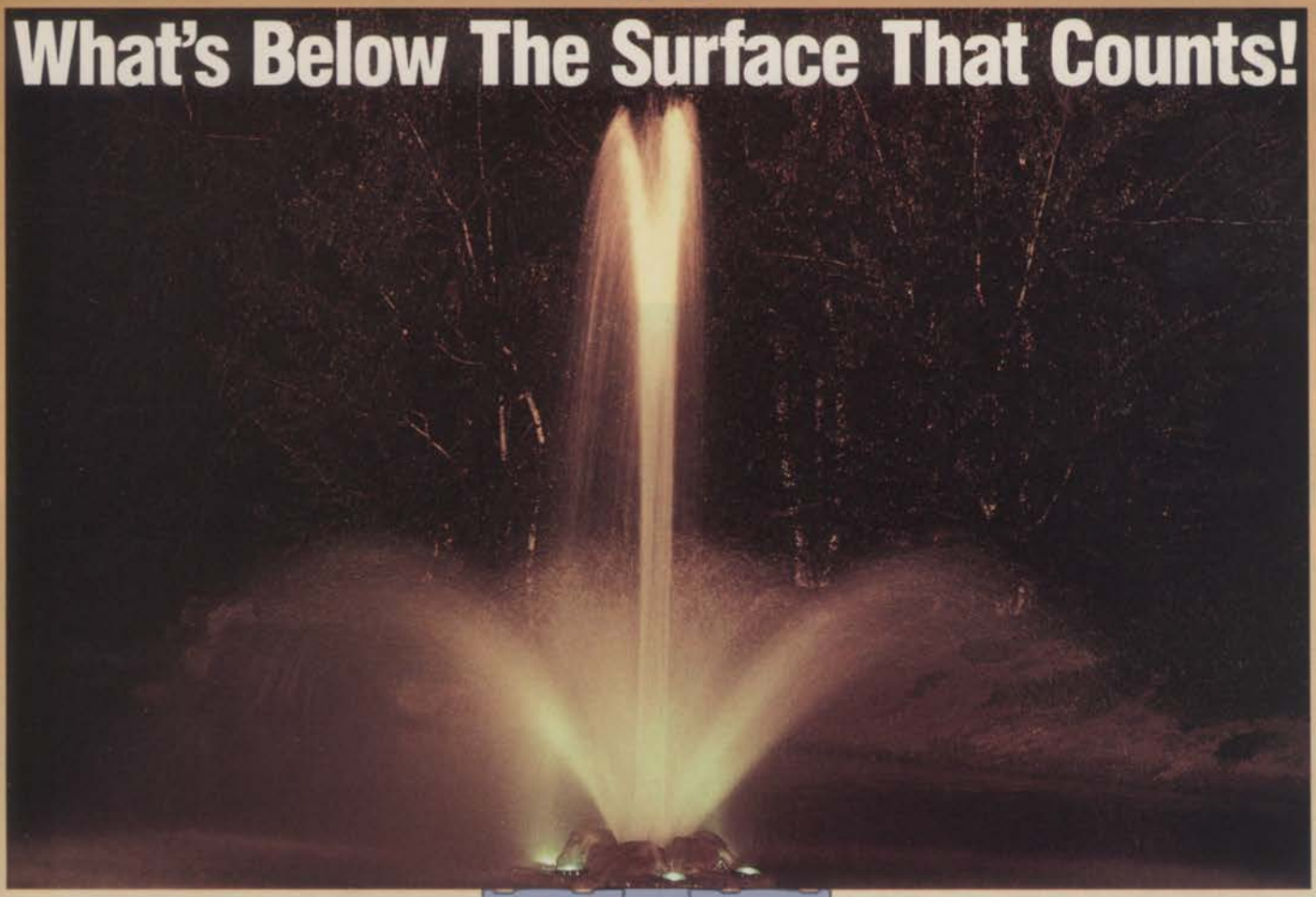
If you got:

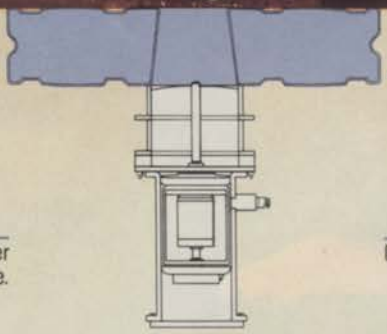
14 right - SHARP!
13 right - WELL DONE!
12 right - not bad
11 right - OK, but ...
10 or less right - more training needed

1. adults
2. False
3. larvae
4. Less than 1 percent
5. insecticide did not reach pest
6. larvae
7. thatch, soil and roots
8. organophosphate
9. at night
11. e
12. c
13. a
14. d
15. b

It's

What's Below The Surface That Counts!





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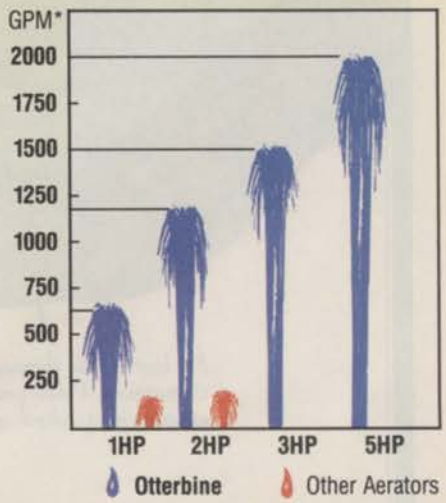

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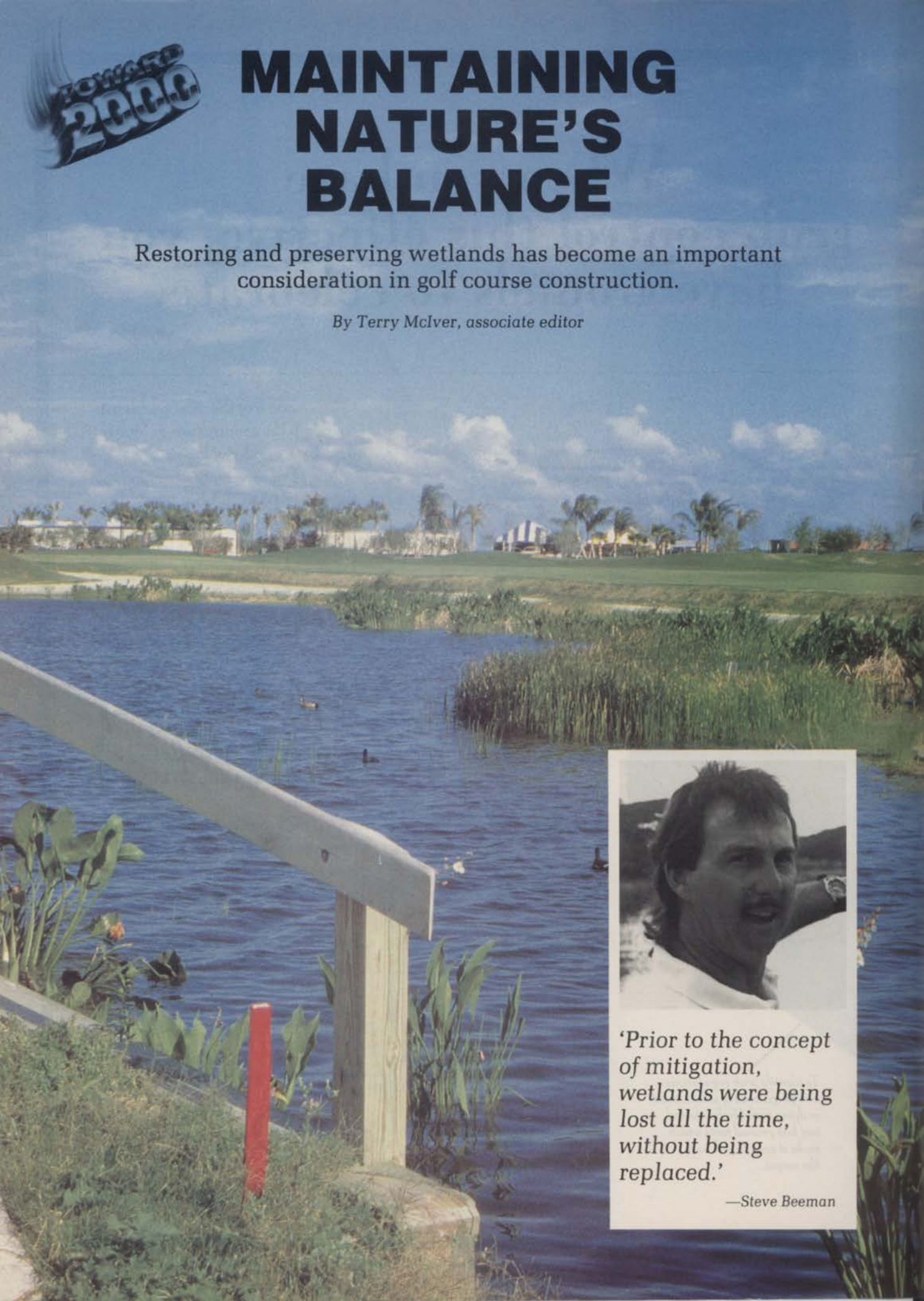
Circle No. 131 on Reader Inquiry Card

MAINTAINING NATURE'S BALANCE

Restoring and preserving wetlands has become an important consideration in golf course construction.

By Terry McIver, associate editor



'Prior to the concept of mitigation, wetlands were being lost all the time, without being replaced.'

—Steve Beeman

As he might tell you in a matter-of-fact way, Steve Beeman builds swamps and marshes. Not the kind you find in the Florida Everglades, but lush and vital wetlands areas that preserve nature's balance within the confines of Florida golf courses.

Beeman's company, Ecoshores, Inc., of Palm Coast, Fla., restores and mitigates freshwater, estuary and dune environments. A marine biologist by training, Beeman started the company with $250 in 1978.

Beeman builds and restores wetlands for golf course developments in northern Florida. A spin-off company, Shoreline Associates, Inc., is run by Pam Reeder, who beautifies the southern half of the state with innovative systems for shoreline protection.

"Water management districts now require that new lakes or open water retention ponds be vegetated with 30 percent of the total surface area in wetland littoral shelves," explains Beeman. "Plants and grasses filter out nutrients, pesticides and fertilizers from the system's water before it is released into other waterways. The shelf allows sunlight penetration onto the shallow bottom, making it a rich nursery for aquatic plants and animals."

Reducing hostility

"To mitigate" means to provide relief, or to make less harsh or hostile. Armed with a variety of wetlands plants such as cord grass, pickerelweed and arrowhead *Sagitaria*, Beeman is present at the early stages of a golf course development to insure that the project does not displace a significant amount of marsh wildlife.

At Hammock Dunes, a private golf community in Palm Coast, Fla., for example, developers identified about 40 acres of functioning wetlands to be preserved. Mosquito ditches and borrow pits were opened up and connected to the marshes and lakes to form a water management system.

Today, more than one year later, cord grass flanks the shores around the community's marshes and lakes, alternately submerged and exposed with varying water levels. The grass grows rapidly and creates an extremely dense root mass for effective erosion control and nutrient uptake.

Taking the initiative

Recent concerns over the depletion of Florida's wetlands makes this concept more popular than when Beeman began Ecoshores 12 years ago. While working as a field biologist for the Florida Department of Environmental Regulation, Beeman noticed that no one was thinking seriously about planting shoreline marshes for erosion control in place of the more costly, often destructive, and bureaucratically controlled method of sea wall construction.

To build a marsh: different plants require varying quantities of saturation, referred to as a hydro-period. This staggered planting method also provides insurance against frequent droughts.

"We began by planting shorelines for erosion control," recalls Beeman. "As it evolved, we built some sand dunes at ocean front golf courses, then fresh water marsh and swamp construction for mitigation, replacement, and also as habitat creation."

Convincing the skeptics

Beeman's work is highly regarded by many golf course and environmental professionals, which leads to a number of good referrals. Some, however, are not easily convinced.

"We've gotten a lot of respect from some true environmentalists," says Beeman, "but we've also gotten a lot of flak from those who don't want to see developers get another tool for developing. They don't realize that prior to the concept of mitigation, wetlands were being lost all the time, without being replaced. In my opinion, it's better to replace them and let them evolve back into a natural wetland."

Beeman notes that golf course developments he works on usually end up with more wetlands on the site than existed originally.

"It's usually part of the plan, part of the agreement worked out between the developer and governmental agencies. We're giving more wetlands back, trying to make up for some of the losses of the past 100 years, when people just went in and wiped out wetlands because they were in the way."

A mandatory, three-year monitoring program is followed once a wetlands project is completed, during which wildlife survivability is monitored and nuisance vegetation removed.

According to Beeman, man-made wetlands do indeed function as natural marshes within that three-year time frame.

"The best sign that you can use to tell that a wetland is being utilized is the presence of benthic animals, which are those that live in the sandy marsh bottoms," Beeman explains. "They're turning it into a natural system, part of the food chain."

Ron Andrews, superintendent of the Grand Harbor Club and River Club in Vero Beach, says another reason state and local governments should encourage mitigation is because many projects result in a net gain of wetlands.

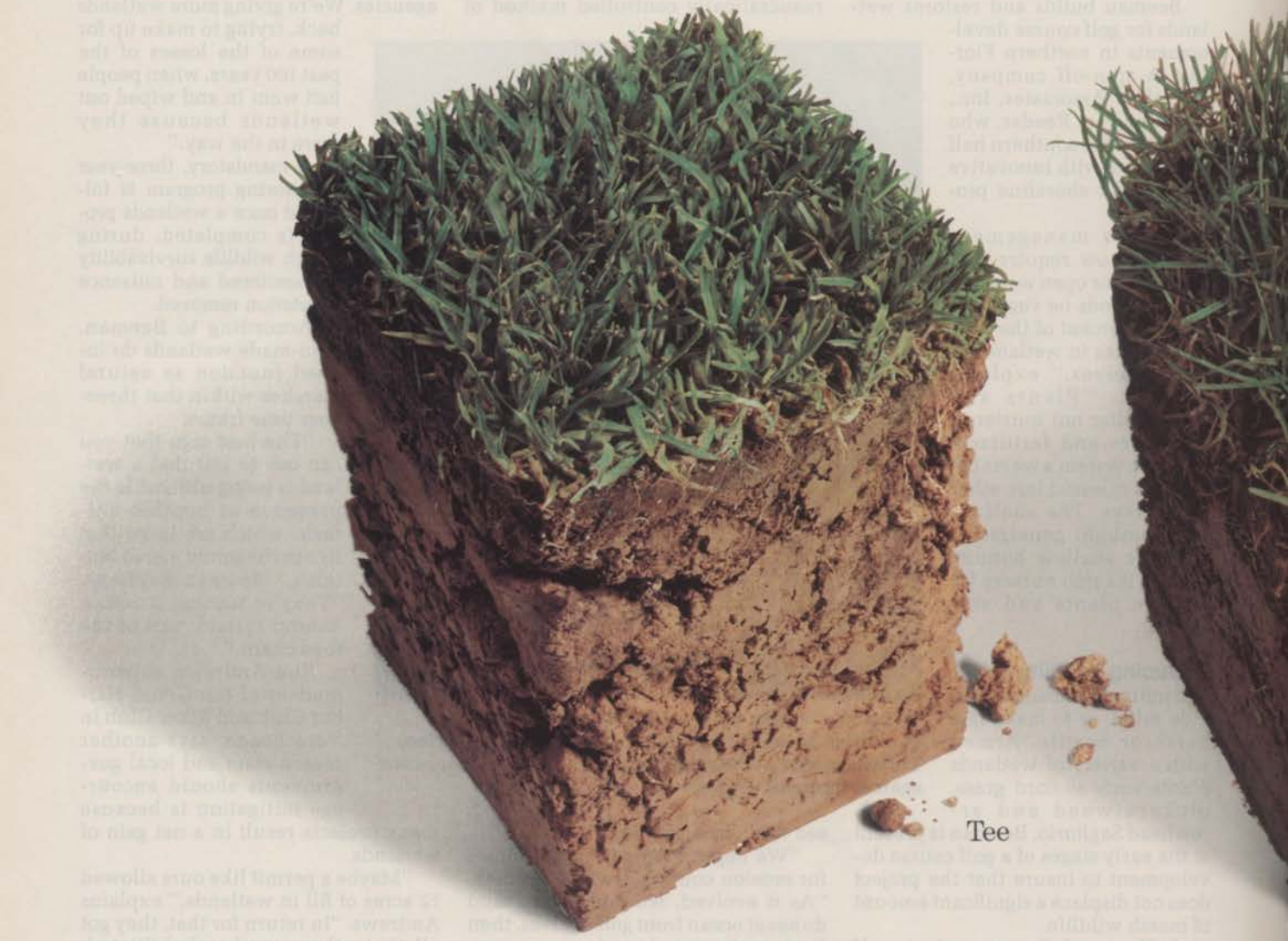
"Maybe a permit like ours allowed 12 acres of fill in wetlands," explains Andrews. "In return for that, they got all that other marsh rehabilitated, along with 43 acres of created marsh."

Andrews believes that if the monitoring program can prove that marsh restoration is successful, more golf course developers will explore mitigation as an advantage when trying to obtain building approval.

Tight government purse strings are another reason Andrews thinks mitigation should be encouraged.

"This is very expensive work," admits Andrews. "The federal government can't afford to do it. And this land cries out to be rehabilitated." **LM**

The Cor



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To the homeowner, overall appearance and performance of a turfgrass are more important than the term "dwarfness."

DWARF TALL FESCUE: WHAT TO EXPECT

The only people who may easily see dwarf characteristics of the new dwarf tall fescues are seed farmers. But the other advantages of these fescues are worth checking out.

by Richard Hurley, Ph.D., Lofts Seed, Inc.

During the past 10 years, there has been tremendous breeding activity of turf-type tall fescue.

Recent selection of breeding material has been toward plants that are finer in leaf texture, darker color, producing denser stands of mown turf, with a slower growth rate. The results are quite dramatic when comparing the best of the new releases to KY-31 tall fescue.

At this time, the top performing commercially-available varieties include Rebel Jr., Avanti, Hubbard 87, Shortstop, Guardian, Monarch, Amigo, Thoroughbred, Normarc 99, Shenandoah, Crossfire, Chieftain and Aztec. These varieties are sometimes referred to as "lower-growing types." By people in the seed industry they are also commonly called "dwarfs" to describe the lower growth habit, slower growth rate and lower overall height of the plants when left unmown and allowed to produce seed.

The term "dwarf" applied to a turf-type tall fescue may not relate to the homeowner, sod grower, golf course superintendent or lawn care specialist. They may not see the dwarf characteristics. The only one who definitely witnesses the lower growth habit is the seed farmer, as the dwarf varieties may attain a lower full mature plant height in comparison with KY-31 or other turf-type varieties.

Scientifically, dwarfness in tall fescues is for real. The factors causing dwarfness or low growth in tall fescues may be a result of one or more of the following:

(1) genetic dwarfness,

(2) increased stand density as a result of increased tillering,

(3) day-length effect with short days of fall and winter causing a change in growth pattern to a lower, slower-growing profile,

(4) plants selected for breeding have a lower leaf canopy and lower crowns (growing point).

To the consumer, the term "dwarf"

may be misleading. Even though these newer types grow slower and produce fewer clippings per mowing, they still have to be mowed.

Drawbacks

The extreme in dwarfness can have drawbacks. To tolerate wear and withstand foot traffic and other abuses, lawns and turf must keep growing to replace damaged, old or worn-out leaves. Even on the healthiest plant, each leaf lives only 3 to 4 weeks during the growing season. So a lawn must be actively growing to stay healthy and provide wear tolerance.

Some of the more extreme lower-growing types may not tolerate traffic well as a result of a slow rate of leaf replacement. The lower growth habit is especially apparent during the short days of fall, winter and early spring. When cooler temperatures have slowed the growth rate, the older leaves have been attacked by net blotch (leaf spot). Another concern with the extreme dwarf types is with a slower rate of establishment and less seedling vigor compared to the original turf-type varieties.

Things to love

The best of the newer commercially-available varieties have characteristics that the consumer can appreciate—like dark green leaf color, fine leaf texture and a dense turf stand.

We should be focusing on overall attractiveness and long-term performance rather than emphasizing the catchword "dwarfness."

continued on page 60

COMPARISON OF TALL FESCUE TYPES

	1 Extreme Dwarf: Turf Types	2 Moderately Low-Growing Turf Types	3 Improved Second Generation Turf Types	4 Original Turf Types	5 Tall Fescues for Low-Maintenance Turfs
Plant height at maturity*	under 35″	Approx. 35-45″	Approx. 45-55″	50″ and taller	50″ and taller
Leaf texture	Fine	Fine	Finer than 4 & 5	Finer than KY-31	All similar to KY-31
Stand density	Dense	Dense	Moderately dense	More dense than KY-31	More open than turf types
Growth rate	Slow	Moderately slow	Slower than 4 & 5	Slower than KY-31	Moderately fast
Appearance	As attractive as bluegrass	As attractive as bluegrass	More attractive than 4 & 5	More attractive than KY-31	Less attractive as a fine turf compared to a turf types
Color	Dark green	Dark green	Darker than 4 & 5	Darker than Category 5	Light green
Establishment rate from seed	Slower than 2, 3, 4 & 5	Slower than 3, 4 & 5	Moderately fast	Moderately fast	Moderately fast
Comments	May provide less traffic tolerance due to slower rate of growth (leaf replacement). May be more prone to pythium and brown patch in hot, humid areas. Good long, term persistence, especially when maintained at 2-3″ or higher.	Good traffic tolerance on established turfs. May show increased disease activity from pythium and brown patch in hot, humid areas. Good long-term persistence, especially when maintained at 2-3″ or higher.	Good traffic tolerance on established turfs. Good fall recovery after summer attacks from pythium and brown patch. Good long-term persistence, especially when maintained at 2-3″ or higher. Improved shade tolerance.	Good traffic tolerance on established turfs. Good fall recovery after summer attacks of pythium and brown patch. Good long-term persistence, especially when maintained at 2-3″ or higher. Good shade tolerance.	Pair traffic tolerance on established turfs. Fewer summer problems from brown patch and pythium compared to groups 1, 2, 3 or 4. Will not persist as well under low heght of cut (less than 2-3″). Does not perform as well in shade compared to turf types.
Sample varieties	Bonsai, Shortstop & Mini Mustang	Rebel Jr. & Hubbard 87	Rebel II, Tribute, Apache, Jaguar II & Bonanza	Rebel, Falcon, Houndog, Olympic, Mustang & Jaguar	KY-31, Fawn, Alta, Kenhy, Tip, Willamette, Mojave, Chesapeake, Clemfine & Richmond

*When left unmown and allowed to produce seedheads.

Source: the author

Performance of commercially available tall fescue cultivars and selections in a turf trial seeded September 1987 at Martinsville, N.J.

Cultivar or Selection	Turf Quality[1] 1988	1989	1988-1989 AVG	Texture[2] 1989	Density[3] 1989	Color[4] 1989
Rebel Jr.	6.4	5.5	6.0	5.5	5.5	6.7
Aztec	6.2	5.7	6.0	6.0	5.2	6.4
Avanti	5.9	5.6	5.8	6.0	5.2	6.4
Hubbard 87	5.6	5.7	5.7	6.0	5.7	5.7
Shortstop	5.7	5.6	5.7	5.7	5.3	6.5
Guardian	5.6	5.7	5.7	5.6	4.7	6.2
Monarch	5.5	5.8	5.7	5.5	6.0	6.6
Normarc 99	5.4	5.8	5.6	5.7	5.4	6.6
Shenandoah	5.9	5.3	5.6	5.8	5.0	6.0
Crossfire	5.5	5.7	5.6	6.1	5.7	6.4
Chieftain	5.8	5.0	5.4	5.7	5.2	5.1
Amigo	5.7	5.1	5.4	5.5	5.9	5.3
Thoroughbred	5.3	5.4	5.4	6.0	5.2	5.2
Trailblazer	5.8	4.8	5.3	5.4	4.7	6.0
Rebel II	5.1	5.4	5.3	5.5	5.4	5.3
Wrangler	5.2	5.2	5.2	5.6	5.5	5.3
Eldorado	5.4	4.9	5.2	4.8	4.9	5.8
Taurus	5.3	4.9	5.1	4.9	4.7	5.7
Sundance	5.3	4.8	5.1	4.8	4.5	5.5
Barnone	5.1	5.0	5.1	5.1	4.5	5.7
Apache	5.2	4.9	5.1	4.7	4.8	5.5
Tribute	5.0	5.1	5.1	5.2	5.4	5.5
Bonanza	5.1	4.8	5.0	6.0	4.5	5.8
Phoenix	4.9	5.0	5.0	4.8	4.8	5.5
Titan	4.9	4.9	4.9	5.5	5.2	4.9
Twilight	5.7	4.1	4.9	5.4	4.4	5.9
Normarc 25	4.9	4.9	4.9	4.9	5.0	5.8
Olympic	4.7	4.9	4.8	4.8	4.4	5.4
Silverado	4.7	4.9	4.8	5.7	4.7	6.4
Winchester	4.8	4.8	4.8	4.7	4.9	5.6
Jaguar II	4.6	4.9	4.8	5.2	4.7	5.3
Murietta	5.1	4.3	4.7	5.8	5.3	5.4
Legend	4.5	4.9	4.7	5.0	4.4	5.5
Carefree	4.5	4.8	4.7	4.9	4.7	4.8
Adventure	4.7	4.6	4.7	4.7	4.5	4.3
Cimmaron	4.9	4.3	4.6	5.2	4.7	5.2
Emperor	4.6	4.6	4.6	5.1	5.0	5.6
Finelawn 5GL	4.3	4.7	4.5	4.7	4.5	5.2
Arid	4.7	4.2	4.5	4.6	4.2	4.5
Jaguar	4.3	4.5	4.4	5.4	4.5	4.7
Mesa	4.5	4.1	4.3	4.7	4.2	5.4
Pacer	4.1	4.4	4.3	4.8	4.2	4.9
Rebel	3.9	4.4	4.2	4.3	3.7	4.1
Richmond	4.3	3.9	4.1	3.8	3.7	4.4
Falcon	4.2	4.0	4.1	4.2	4.0	4.1
Finelawn I	3.8	3.8	3.8	3.7	3.5	4.2
Fatima	3.8	3.7	3.8	3.8	3.8	3.9
Trident	3.7	3.6	3.7	3.7	3.2	5.0
Tip	4.0	3.0	3.5	3.5	3.3	3.7
KY-31	3.7	3.1	3.4	3.0	2.5	3.3
Willamette	3.3	3.3	3.3	3.6	3.7	3.9
LSD at 5% =	0.8	0.7	0.6	0.8	1.0	0.6

[1]9 = best turf quality
[2]9 = finest leaf texture
[3]9 = densest turf
[4]9 = darkest green color

Source: The author

The variety Rebel Jr. is an example of a lower-growing fescue, but not to the extreme as provided in the variety Bonsai. The more moderate growth pattern of Rebel Jr. and similar types may have a distinct advantage over the more extreme lower-growing types, especially when used in the humid disease-prone areas of the southeast U.S. and middle Atlantic states.

Recent data from variety evaluation trials conducted at Rutgers, University and university-sponsored test sites show a distinct summer decline in some of the newer so-called dwarf-

Many of the newer varieties can produce a denser turf compared to the original turf types.

types (see tables). This may be due to increased disease activity from brown patch and pythium, and possibly less heat and drought tolerance caused by excessive plant density. More research is needed to determine the exact cause of this summer decline as observed on some dwarfs.

Many of the newer varieties can produce a denser turf compared to the original turf types. But turf density can be increased to a degree by other factors, including frequent closer mowing, irrigation and adequate fertility. Although increased turf density provides a more attractive, wear-resistant turf, it may also subject the turf to more drought stress and certain density-associated diseases such as pythium blight and rhizoctonia brown patch.

Everyone should be aware of some claims made within the seed industry when erroneously categorizing some tall fescue varieties as dwarf types. Varieties such as Richmond, Mojave and Willamette should not be confused with dwarfs. In actuality these varieties, along with Clemfine, Tip and Chesapeake, are not much different in overall turf qualities compared to KY-31.

To make matters easier, the varieties of tall fescues presently being marketed can be grouped into five main categories. These catagories are summarized in the table on page 58. However, there are additional varieties (many of which are listed in the performance trials that follow) that are intermediate between these five categories. **LM**

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DISEASE CONTROL FOR ORNAMENTALS

When conditions are right, ornamentals are easily susceptible to disease. Effective disease control begins with prevention.

by Douglas Chapman, Dow Gardens

Disease control strategies for use on ornamentals are varied. They include the use of resistant cultivars, planting in the correct ecological niche, proper sanitation, plant diversity and health, and the use of fungicides.

To understand disease control, the conditions favorable for infection must first be understood. If one of these four conditions is not met, then infection of the plant does not occur.

The main conditions needed for infection are: (1) the presence of a pathogen, (2) free water, (3) temperature favorable to infection, and (4) a suitable host.

Don't let water linger

Any conditions or practices that either reduce the amount of time moisture is on the foliage or impacts the roots lessens the opportunity for disease infection. This can mean watering plants in the morning so they have time to dry before evening, removing dew by "poling greens," or setting up conditions for good soil drainage.

Conditions for good drainage can mean a well-drained medium for a pot crop, or surface sloping and drainage tiles for landscape plants in areas where the soil is slow to drain.

Temperature adjustment in the landscape is all but impossible. But if correct temperatures exist for disease infection to occur, one can either delay watering (if possible), or be aware of when conditions are right for fungicide application. For example: anthracnose becomes a problem

Cedar apple rust covers leaves of a Hawthorn tree.

DISEASE-RESISTANT CRAB APPLE VARIETIES

The following crab apple tree varieties are resistant to applescab, fireblight, and several minor foliar diseases. It should be stressed that these trees are for the upper Great Lakes region of the U.S. Resistance will vary in other parts of the country.

Adams
Beverly
Bob White
Candied Apple
Centurian
Christmas Holly
David
Donald Wyman
floribunda
Halliana parkmanii
Harvest Gold
hupehensis
Indian Magic
Indian Summer
Jewelberry
Liset
Mary Potter
Molten Lava
Ormiston Roy
Prairiefire
Professor Sprenger
Profusion
Red Baron
Red Jewel
Red Splendor
Royalty
Ruby Luster
Sentinel
Silver Moon
Snowdrift
Strawberry Parfait
Sugar Tyme
tschonoskii
White Angel
White Cascade
Winter Gold

—*Dr. Chapman*□

The Hopa crab apple tree on the right is in full bloom after treatment the previous year for applescab disease. The control tree is on the left. (All photos by Dr. D.L. Caldwell, The Davey Tree Company. Used by permission.)

when temperatures reach the high 40s during late spring.

Crab apple trees resistant

A suitable host is one area that can frequently be adjusted as a disease control strategy. This can mean planting disease-resistant varieties.

One of the classic strategies used in the contemporary landscape is using disease-resistant crab apple trees. By selecting a resistant cultivar, one can all but eliminate the need for multiple pest control applications, while keeping healthy, well-foliated crab apples (see chart).

Diversity is another strategy that can be used to reduce the impact of any one disease. In designing a landscape, use many different plant types. All landscape managers know that

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Apple scab lesions infect this crab apple leaf.

monoculture, be it turfgrasss (Merion bluegrass), shrubs (Andorra juniper) or trees (elm) can lead to problems. As we increase the variety of plants in a landscape, the opportunities for infection decrease and catastrophic plant death is reduced.

Isolate infected plants

Sanitation is one way to reduce the source of pathogens. If a plant becomes infected by a disease, the infected parts or the entire plant should be removed and destroyed.

During the early stages of fireblight infection, many canker diseases can be slowed or eliminated by removing the branch below visible signs of infection.

Plants in the correct ecological niche help many from becoming infected. Junipers grow best in full sun and infertile, well-drained soils. Generally speaking, junipers grown in the shade thin and die out. Further, junipers growing in landscapes composed of fertile soil that are frequently irrigated get a disease called *Phomopsis juniperovora*.

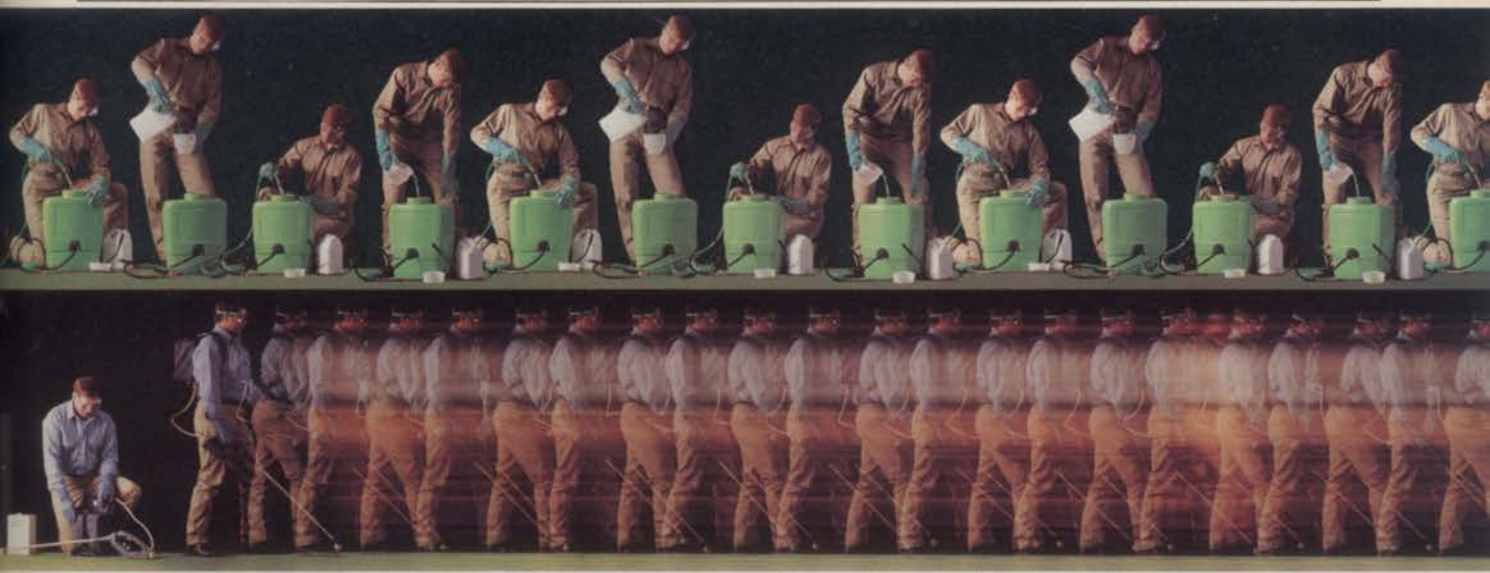
If growing is necessary under these conditions, apply fungicides regularly or grow restricted lists of resistant cultivars such as *Juniperus chinensis* (Ames), Armstrongil, Fairview, Hetzii, Keteleeri, Mountbatten, *Pfitzeriana compacta, sargentii and procumbens, Juniperus horizontalis (Douglasii)*, Emerald Spreader, *Wiltoni, Juniperus sabina* (Acadia), Broadmoor, and Von Ehron.

When the above strategies aren't economically feasible, fungicide application should be considered. Identify the cause of the disease prior to chemical application.

Preventing plant diseases remains the cornerstone of a good ornamental disease control program. **LM**

Dr. Chapman is horticulturist-administrator of The Dow Gardens in Midland, Mich., and an editorial advisor to LANDSCAPE MANAGEMENT.

The chart on page 66 of fungicides for use on ornamentals shows examples of fungicides that can be used to control diseases. Since approved chemicals may vary from state to state, check the label and local cooperative extension service for specific recommendations in your area.



MORE PRODUCTIVE

Make better time without having to constantly refill.

One 1.3-gallon box of Expedite® herbicide can treat the same area covered by a 3-gallon backpack refilled 15 to 25 times! Expedite is also easy to use — yet precisely accurate. So you reduce the chances for mixing errors and waste.

Make a change for the better. Contact your local Greens Center or call toll-free: **1-800-323-1421.**

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THE BETTER WAY TO SPRAY.

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EXP-0-101 (I)

FUNGICIDES FOR ORNAMENTALS

Chemical Common Name	Brand Name	Mode of Action	Disease Controlled
Propiconazole	Banner	Systemic	Rusts, foliar diseases (many ascomycetes)
Ethazol + Thiophanate Methyl	Banrot	Soil fungicide	Phytophythora, pythium, rhizoctonia
Triadimefon	Bayleton	Systemic	Powdery mildew, rusts
Benomyl	Benlate	Systemic	Apple scab, powdery mildew, botrytis, rhizoctonia (damping off)
Bordeaux	Bordeaux	Protectant fungicide	Powdery mildew, diplodia tip blight of pines, fire blight
Iprodione	Chipco 26019	Contact	Botrytis, sclerotinia, rhizoctonia
Chlorothalonil	Daconil 2787		Apple scab, botrytis, rusts, powdery mildew
Maneb	Maneb	Foliar treatment	Rusts, leaf spots
Mancozeb	Manzate, Fore		Rusts (cedar apple rust), phytophthora, anthracnose, needle case (Lophodermium pinastri)
Vinclozolin	Ornalin		Botrytis, sclerotinia, turf (dollar spot, helminthosporium)
Metalaxyl	Subdue	Systemic	Pythium, phytophthora (rhododendrons)
Sulfur	Sulfur		Powdery mildew, black spot
Quintozene	Terraclor	Soil fungicide	Root rots, botrytis
Triforine	Triforine	Eradicant	Powdery mildew, rusts, apple scab
Zineb	Zineb	Foliar treatment	Leaf spots, rusts (cedar apple)

MORE PROTECTION

Closed system offers better worker protection.

Expedite® herbicides are premeasured and premixed. So you don't come in direct contact with them. You simply connect the Expedite lance hose to a sealed 1.3-gallon box of herbicide. Then set the lance and you're ready to spray.
Make a change for the better. Contact your local Greens Center or call toll-free: **1-800-323-1421.**

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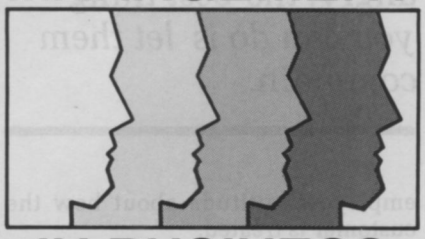
EXP-0-102 (I)

HANDLING CUSTOMER COMPLAINTS

Every service business needs a cool-headed, well-spoken person to appease the occasional irate customer.

by Rudd McGary, Ph.D.

MANAGEMENT



IN BUSINESS

More and more, the way a company handles complaints is becoming a major issue for the consumer.

From the customer's viewpoint, there are several companies in your market area that are capable of delivering the services they require. If you can't do it, they'll find someone who will. Consequently, as long as prices remain competitive, the company ultimately chosen by the consumer is the one that communicates best, and is probably the one with the highest profitability and growth rate, too!

How a company handles complaints often plays a major part in the customer communication process. Therefore, it's important for your company to consider three areas when formulating a successful complaint response program.

Office mechanisms

First, there are office mechanisms that need to be in place in order to make sure complaints are handled effectively. Second, certain techniques need to be used by the people who are actually going to handle these complaints. Finally, it's important that employees' attitudes reflect a spirit of cooperation—not confrontation.

It is always best if one person handles complaint calls. This person has to be good on the phone, with an ability to listen to angry people without responding in kind, and to direct complaints to the correct person or department.

If there's no way you can route complaint calls through just one person, use several—but don't have everyone in the office taking these calls. Some people are simply better at it than others.

Logging complaints

Make sure all complaint calls are logged. Put in the date of the call, who took it, and most importantly, what was done about it.

This complaint response system should allow you to track the handling of the complaint. A quick glance at the log book should reveal when and why the complaint was made, who handled it and how.

Today's customer isn't satisfied by simply talking with your office. Action must occur that helps rectify the perceived problem.

After you're sure that someone has responded to the complaint, it's a good idea to call the customer a few days later to make sure they're satisfied with the company's actions. Most companies don't do this, which is why yours should.

Your technique

If someone is angry, the best possible thing you can do is let them air their complaint. Give them the opportunity to express themselves without interruption.

It's often hard to let someone ramble on when you have the solution to the problem. However, it's important to remember that the caller wants to make sure you understand why they're calling.

The receiver of the complaint should take notes about the nature of the complaint. This will help make the log book as thorough as possible.

Always restate the complaint to make sure that you have heard it correctly. This helps you to focus on the problem and lets the person know that the complaint has been heard.

Making peace

After carefully listening to and logging the complaint, it's time to offer the customer a solution. This solution must have a tangible start. For example, don't simply say, "Someone will get back to you." Instead, give them something more concrete such as, "The crew chief will be back to you by 4:30 this afternoon."

By using people's titles and a definite response time, the consumer will regard your efforts as more sincere.

Conclude the conversation by asking if there is anything else that can be done. In some cases the person calling is so obnoxious it's impossible to deal with the complaint. But in most cases the caller will be fairly easy to talk to, especially after you've completed the above steps.

Customers aren't always right, but they always think they are.

Employee attitude

Customers aren't always right, but they always think they are. Make sure you understand that perspective and remember that whatever their complaint is, it is a valid one.

Often you'll find that allowing customers to complain will itself get rid of the problem. The key is understanding that customers wouldn't call with a complaint unless they felt it was legitimate.

Keep in mind that the customer isn't angry with you personally, but with something that happened. This may be difficult when there is a really

ON-THE-SPOT COVERAGE.

Lebanon Turf Fungicide with BAYLETON® 1G

If you're looking for economical control of dollar spot and other turf diseases, use Lebanon Turf Fungicide with Bayleton 1G. Bayleton provides preventative and curative control of dollar spot, anthracnose, powdery mildew, red thread, rusts, brown patch, fusarium blight and snow molds. Formulated on a granular cob base for easy spreading, Bayleton works systemically to fight and control disease. And the long-lasting residual action of Bayleton makes it one of the most effective products on the market. From the source for premium quality turf products—your local Lebanon distributor.

Lebanon
TOTAL TURF CARE
A division of Lebanon Chemical Corporation

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Circle No. 126 on Reader Inquiry Card

obnoxious person on the phone, but it's important. If necessary, keep repeating it to yourself while talking with them.

Your attitude should acknowledge that the customer is the only reason you are in business. It doesn't make dealing with obnoxious or surly people any easier, but if you do a good job, most people will respond in kind.

Customer as king

The understanding that the customer is the key to a successful business should be the cornerstone of every employees' attitude about how the customer is treated.

If someone is angry, the best thing you can do is let them complain.

The way a company communicates with its customers when handling problem or complaint calls may determine whether or not the customer remains a customer.

It's extremely important to let everyone in the organization know what is expected, how to do it, and who is responsible for the handling of customer complaints.

Many companies excel technically but fail to communicate effectively. By taking the initiative in complaint response, you can keep even unhappy customers happy. **LM**

Rudd McGary, Ph.D., is a senior consultant with All-Green Management Associates in Columbus, Ohio.

HOW TO EXTINGUISH A FIRE ANT.

It's taken forty years and countless ill-conceived attempts for mankind to come to grips with one fundamental truth about imported fire ants.

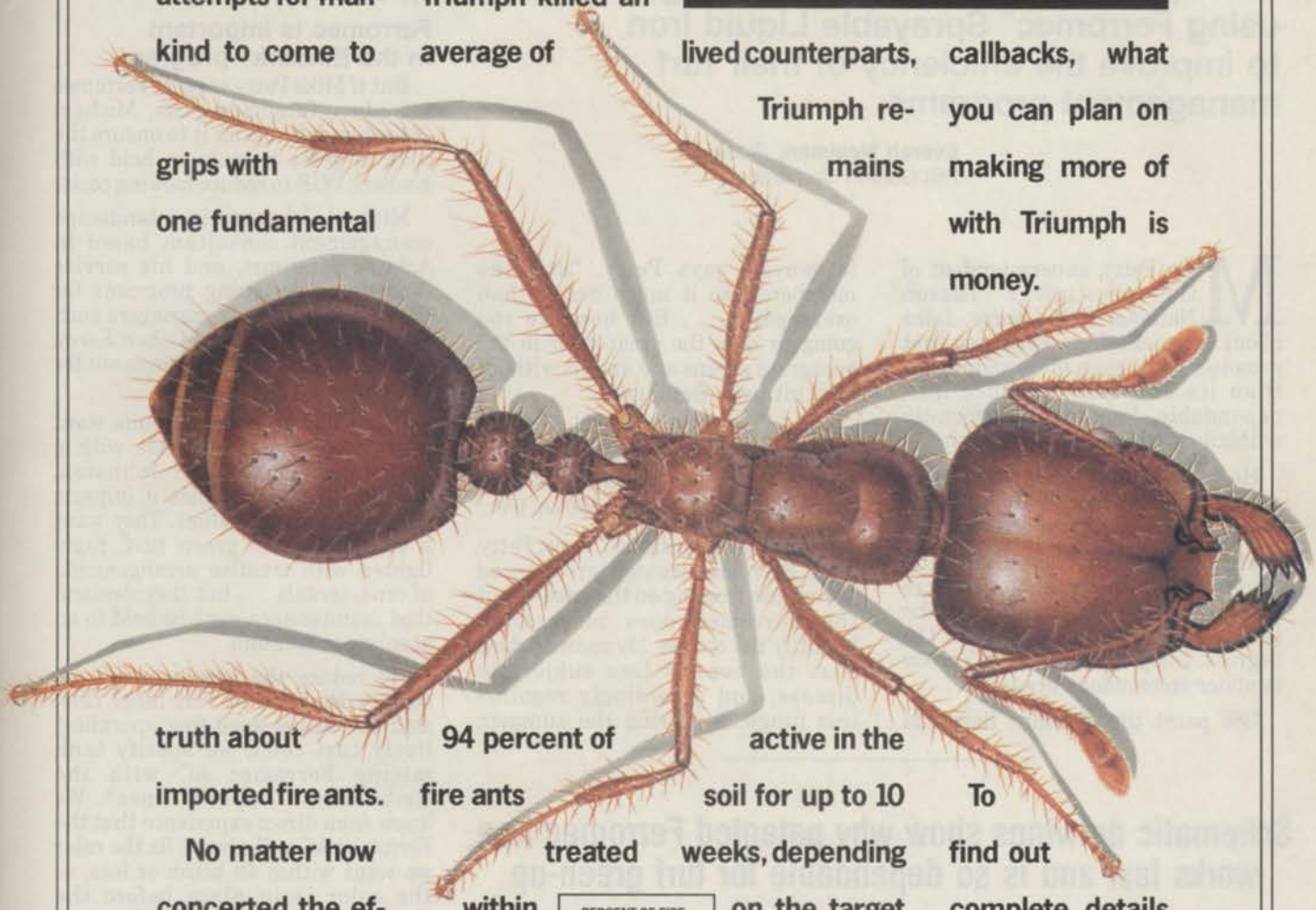
No matter how concerted the effort, no matter how ingenious the attack, they cannot be eradicated.

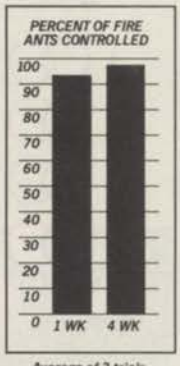
However, they now can be controlled by Triumph® insecticide.

In university tests, Triumph killed an average of 94 percent of fire ants treated within one week of application.

Better still, unlike its short-lived counterparts, Triumph remains active in the soil for up to 10 weeks, depending on the target pest.

Which means that instead of more applications, instead of more callbacks, what you can plan on making more of with Triumph is money.





Average of 3 trials, Mississippi State University, 1989

To find out complete details, contact your turf products distributor or Ciba-Geigy marketing representative.

TRIUMPH

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For retail sale to and use only by certified applicators or persons under their direct supervision, and only for those uses covered by the applicator certification.

Fast, dependable green-up without unwanted growth

Read how golf course superintendents and other professional landscape managers are using Ferromec® Sprayable Liquid Iron to improve the efficiency of their turf management programs.

Everett Mealman, *President*
PBI/Gordon Corporation

Mike Petty, superintendent of the prestigious Tucson National Golf Course, talks about a benefit from Ferromec that promises to be even more significant than its ability to produce fast, dependable, long-lasting green-up without causing excessive mowing.

He sums it up this way: "Ferromec applications, rather than nitrogen, reduce susceptibility to disease."

The weather in Tucson is really tough on bentgrass. It freezes frequently, and in the summer the temperature can get up to 115 degrees. Indeed, bentgrass in Tucson is under tremendous pressure.

"We paint the dormant Bermuda fairways," says Petty, "and the members like it much better than overseeding . . . But how are you going to keep the great color in the bentgrass greens and aprons without high nitrogen feedings?"

Petty answers his own question by saying that he sprays the greens and aprons 26 times a year with four ounces of Ferromec per 1,000 sq. feet.

"It does a beautiful job," says Petty. "The Ferromec-treated greens and aprons are frosting on the cake — but the Ferromec does more than beautify the course. My records show that the bent is less subject to disease, and accordingly requires less fungicide during the summer, when I spray it regularly with Ferromec, as opposed to high applications of nitrogen."

Ferromec is important in the Embark® program

But if Mike Petty expects Ferromec to reduce fungicide costs, Michael Johnston depends on it to ensure the color of grass he puts on hold with Embark PGR to reduce mowing costs.

Michael Johnston is a landscape management consultant based in Asbury, Missouri, and his service consists of designing programs for commercial property managers such as Trammell Crow and Cohen Esrey, who then put Johnston's specs out for bids.

"More and more, our clients want their properties to sparkle with a manicured look," says Johnston, "because they know that it impacts directly on rental values. They want a carpet of lush green turf, highlighted with creative arrangements of ornamentals . . . but they demand that maintenance costs be held to an absolute minimuim.

"To reduce the mowing costs, we specify Embark at full label rate. And to assure weed-free sparkling, lively turf color, we specify tank mixing Ferromec AC with the Embark and Super Trimec®. We know from direct experience that the Ferromec AC will always fix the color we want within 48 hours or less, so the color is in place before the Embark kicks in and puts the grass on hold."

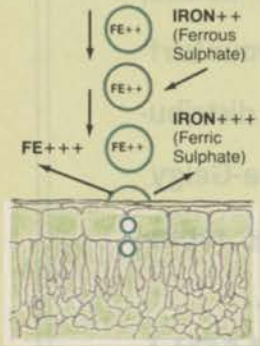
Ferromec works! You can depend on it! But that's not necessarily so of all sprayable irons, according to Tom Garvey, who has a Servicemaster franchise in El Cajon (San Diego), California.

Garvey caters to upscale homeowners who insist on color but hate the necessity of too much nitrogen, too much irrigation, and too much mowing.

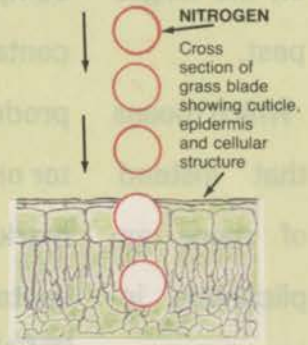
"When I saw with my own eyes what George Toma was able to do with Ferromec at Jack Murphy Stadium for the '88 Super Bowl, I decided to try it," says Garvey.

"Today we spray Ferromec every seven weeks at a rate of five ounces

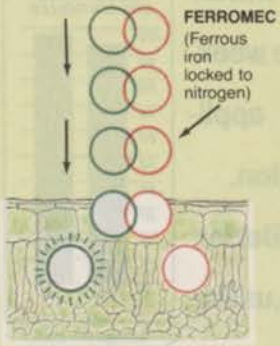
Schematic drawings show why patented Ferromec iron works fast and is so dependable for turf green-up



Iron is essential for the synthesis of chlorophyl — no iron, no green. But grass doesn't like the *taste of iron* and is very reluctant to ingest it. Furthermore, iron must be in the ferrous ++ state to efficiently create green color, and it tends to revert to the inefficient ferric +++ state when exposed to oxygen.

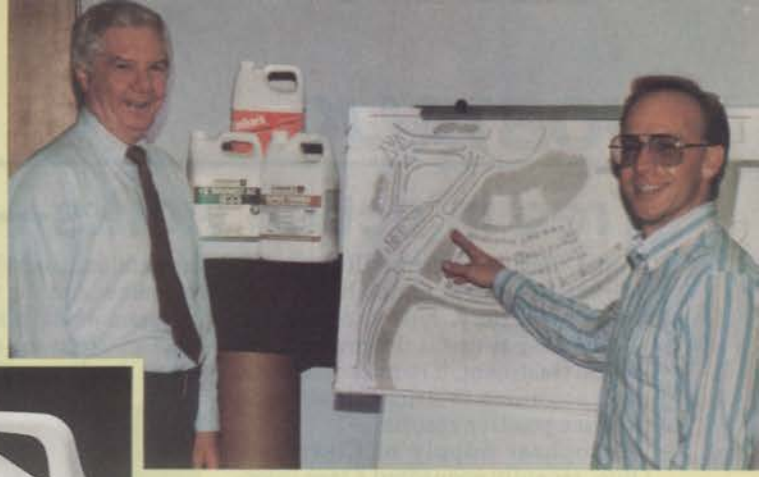


On the other hand, turfgrass loves the *taste of nitrogen* and ingests it with gusto. Nitrogen-induced growth, of course, will pull iron out of the soil and thus create green color, but the amount required to produce color will result in abnormal growth, which in turn causes unwanted mowing and exposure to disease.



Ferromec is a Complex of ferrous sulphate and nitrogen, which locks the iron in the usable ferrous state. Grass loves nitrogen and readily ingests Ferromec, thus delivering the color-producing iron. But at the 5-oz. rate, only .063 pounds of nitrogen per 1,000 sq. ft. is delivered by Ferromec, and excessive growth does not occur.

Tom Garvey has built his Servicemaster franchise lawn care business in El Cajon, California on the basis of five ounces of Ferromec per 1,000 sq. feet every seven weeks. Green is the name of the game: green grass, green uniforms; and green stuff in the wallet. "But be sure it's Ferromec," warns Garvey. "Substitutes don't always work fast enough or last long enough."



Michael Johnston (right), landscaping consultant, shows Everett Mealman a rough preliminary design for a commercial landscaping institution. "Someday this will be a beautiful layout," says Johnston. "The grass will be a lush vibrant green, and yet will only require a minimum of mowing because our specs will call for a Ferromec/Embark/Super Trimec program."

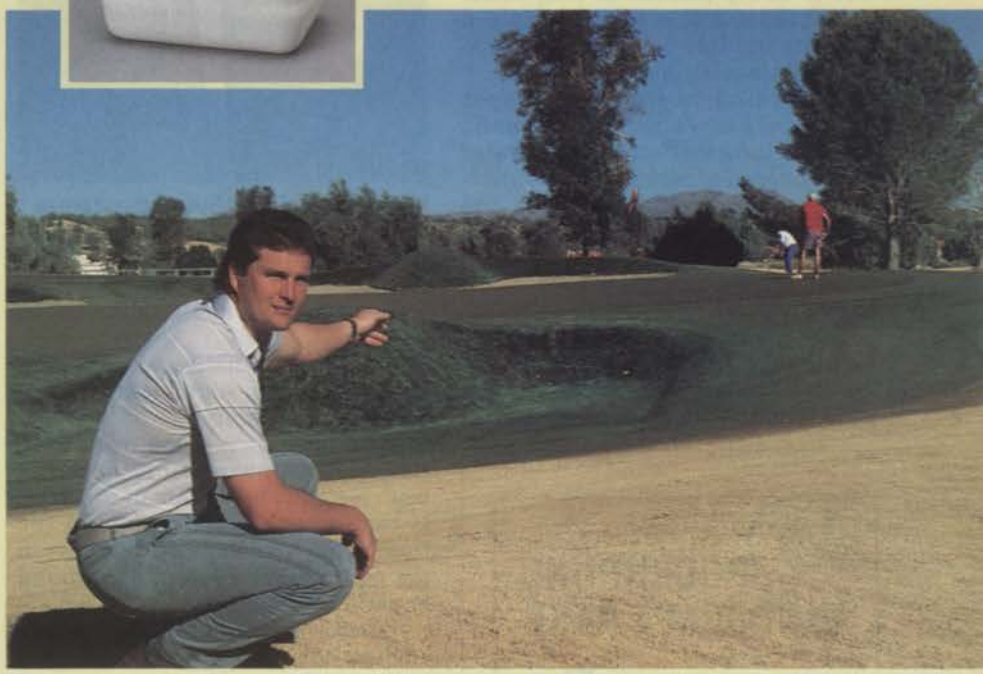
per 1,000 sq. ft., and the results are so positive that the very backbone of our business is word-of-mouth from customers whose friends and neighbors have asked them how in the world they keep their grass so green without all that mowing."

Ferromec works when regular irons fail

But Garvey goes on to say that, for his program, it *has* to be Ferromec. "Last year our distributor was temporarily out of Ferromec, and we tried a substitute brand that was advertised as *just like Ferromec, only less expensive.*"

"What a lesson I learned," says Garvey. "Five ounces of the substitute iron did nothing. A repeat of five more ounces was needed to get the kind of green we're accustomed to, and the color only held up for four weeks, versus the six weeks we get from Ferromec."

Why is Ferromec so fast, and so dependable, and so long lasting? It's because of the patented nitrogen-iron bonding process. To satisfy your professional curiosity, we suggest you spend a minute with the schematic drawings on the opposite page, which explain its unique activity.



Mike Petty, superintendent of the Tucson National Course, paints his dormant Bermuda fairways with a turf colorant and sprays the bentgrass greens and aprons 26 times a year with four ounces of Ferromec per 1,000 sq. feet. He loves the color and insists that Ferromec applications, rather than nitrogen, reduce susceptibility to disease. (Foreground is unpainted rough.)

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AMINE COMPATIBLE LIQUID IRON

Circle No. 140 on Reader Inquiry Card

732-290

Tree injection works—when done well

Proper diagnosis of tree illnesses requires that strict attention be given to the tree's history, type and location.

Once the cause is determined, injection treatment, if required, must be done according to strict guidelines to produce positive results.

Lanphear Supply of Cleveland, Ohio, recently sponsored a tree injection seminar to examine proper tree diagnosis and injection treatment.

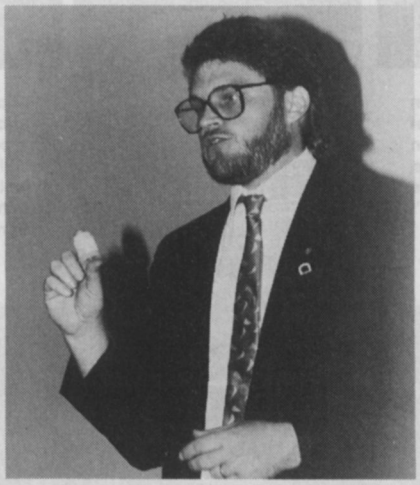
Tim Johnson of Artistic Arborists, Phoenix, Ariz., believes there may be something in a tree's past that has a direct effect on its present condition. These factors include whether the tree is newly planted or long established; the source of the plant; date of planting and tree condition; soil type and maintenance history.

According to Johnson, proper tracking of a tree's history also should include information on the water source, speed of percolation, fertilization programs, pruning, disease and pest history and on-site environmental conditions.

How does it look?

"Then you must look at the plant itself," says Johnson. "Look at its appearance, which includes the root zone, trunk, canopy, flower or fruit production, and the overall healthy appearance of the tree."

When examining a tree's roots, for example, Johnson says to take into account the degree of root flare, root development, color and stability in the ground.



Lauren Lanphear: Soil temperature is the most critical factor to consider during tree injections."

Trunk examination should consider bark color, soundness and evidence of prior injury.

With inspection of the tree's location, determine whether care has been periodic, haphazard or frequent. Is there much activity around the tree? What was the area used for in the past? Was it a forest, playground or parking lot?

When you look at the site, Johnson advises, look at a number of soil characteristics: soil type, pH, moisture, oxygen level, compaction, salt content, percolation, temperature and hardness.

Proper injection

Lauren Lanphear, president of Lanphear Supply, is a disciple of the Mauget system of tree injection. One of the benefits to the system is that minimal depth is required.

"With the Mauget system, drilling is usually done at 1/4-inch," says Lanphear, "wheareas some injection system require drilling as deep as three inches.

"But even a tiny drilling requires that you wound the tree, so care must be taken.

"Be aware of drilling into non-living tissue," advises Lanphear. "Your most active tissue is going to be located directly inside the bark, in the non-functional xylem."

Avoid injecting into decayed areas; chemical activity will cease.

Citing research from the University of Illinois, Lanphear says wounds that are 3/8-inch in diameter invariably close within one year.

Avoid injections into root valleys. "The mid-root flare area is the best place to inject," says Lanphear, "followed by the lower root flare or the root itself.

"The stem or trunk, or below or beside an existing wound are the least desirable injection sites."

Timing: spring is best

Injection treatments are most effective when done in spring.

"Later in the year, you'll get less closure," advises Lanphear. "If you inject in fall or early winter, realize that there's a lot of fungal spores in the air at that time of year, and you can expose the wound to greater risk."

Mid-day injections are more effective than those performed in early morning or late afternoon.

High air temperature (75°F), low humidity and sunlight are also desirable.

"The lower the humidity, the less pressure there is on the transpiration system," says Lanphear. "And sunlight helps raise the intake pressure inside the xylem."

Look at the family tree

Genetics impacts wounding to a great degree. "It controls compartmentalization," explains Lanphear. "You have to become familiar with which trees respond better to wounds. Among species, one will be better than another. Between species, some trees we describe as short-lived trees: willows, cherry, cottonwood."

This is when prior injury can tell a tale.

"Look at old pruning wounds or areas where branches have naturally broken off," says Lanphear. "If it's clear that a tree doesn't close its wounds quickly, that's a tree you might not want to inject. Also, monitor the trees you inject. Do not inject a tree if it's cracking or bleeding.

The most critical factor of all, says Lanphear, is soil temperature.

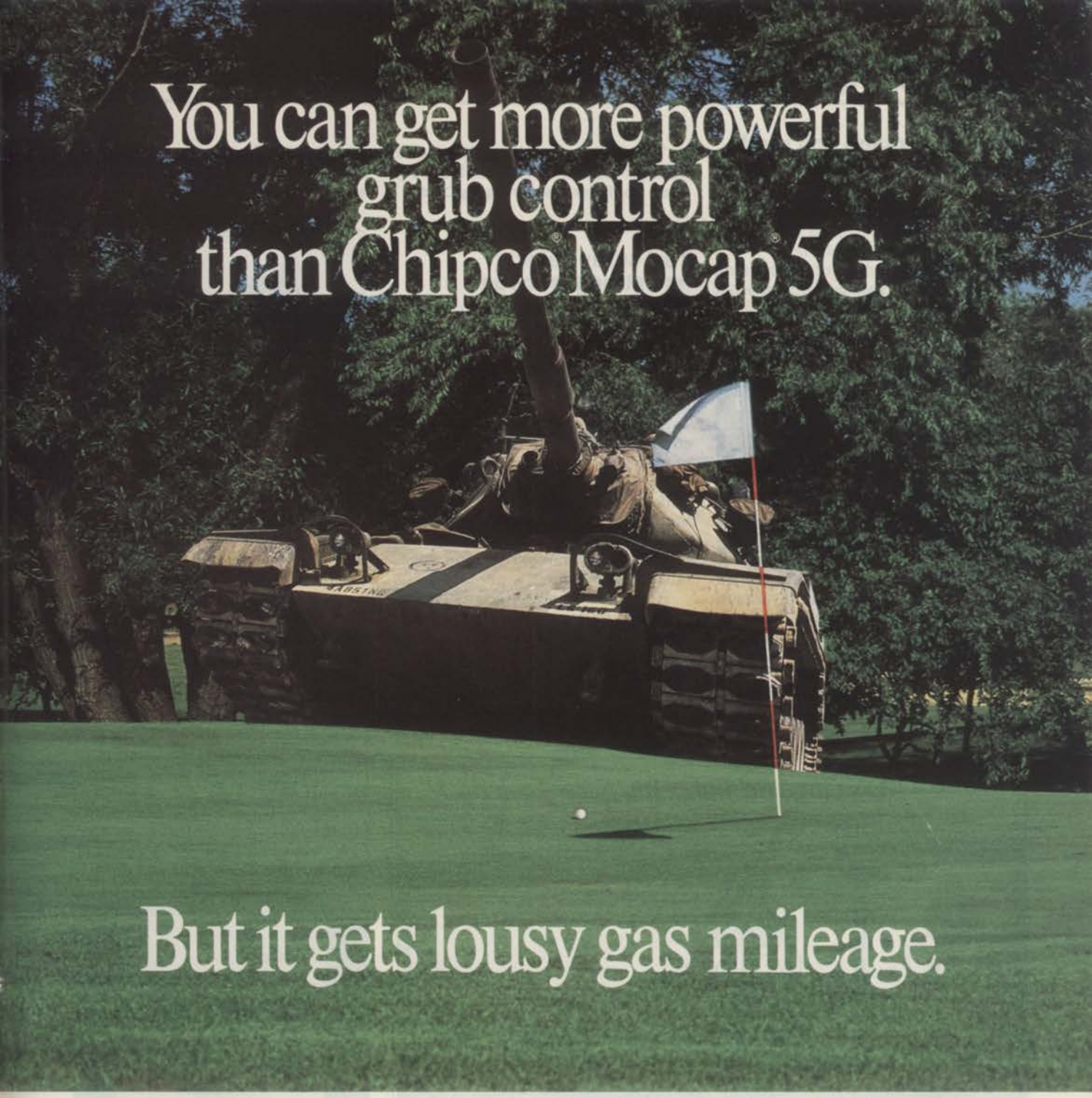
"When we inject a tree, we're plugging into the tree's natural uptake system. Soil temperature is what activates that uptake. Root activity ceases at temperatures below 30°F.

"At 50°F and above," says Lanphear, "the transpiration system is at full go."

—*Terry McIver*□

Circle No. 125 on Reader Inquiry Card

You can get more powerful grub control than Chipco® Mocap® 5G.



But it gets lousy gas mileage.

It's also tough to putt around. Fortunately, there's an easier solution, because the best grub control you can buy comes in a bag: CHIPCO® MOCAP® brand 5G pesticide. In fact, studies at a leading university show that CHIPCO® MOCAP® brand 5G delivers up to 97% effective control of white grubs. Plus, superior control of chinchbugs, sod webworms, bluegrass billbugs, black turfgrass Ataenius and mole crickets. And, you can use CHIPCO® MOCAP® brand 5G pesticide with confidence on nearly all types of turfgrass, including Bent, Bahia, Bermuda, Centipede, Fescue, Kentucky Bluegrass, St. Augustine, Zoysia and Perennial Rye species. Need another reason for choosing CHIPCO® MOCAP® brand 5G? Then, consider this: CHIPCO® MOCAP® brand 5G provides this outstanding control for up to five full weeks. That saves time, trouble and money. So, let the Army worry about gas mileage. Get the most effective grub control money can buy with CHIPCO® MOCAP® brand 5G pesticide. Available at your turfcare chemicals supplier today.

Chipco® Mocap® 5G
Brand Pesticide

RHÔNE-POULENC

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Hydraulic dump unit ready for use in green industry

E-Z Dumper, the original hydraulically operated dump unit for pickup trucks is designed to hold and load up to 2 tons of material.

The unit will dump on command and in seconds you can unload what would take an hour to unload by hand.

Valley Manufacturing, Inc. says

the E-Z Dumper can hold and unload up to 4,000 lbs. or two cubic yards of firewood, topsoil, gravel, mulch, grain, or other material, depending on the weight-carrying capacity of your truck.

No alterations are required for most trucks. The unit easily installs into truckbeds with just a few bolts.

The fully hydraulic unit operates on any standard 12-volt truck battery.

Circle No. 191 on Reader Inquiry Card

Turf spray vehicle has strongest boom

Smithco has introduced a turf-spray-dedicated vehicle with what is described as the strongest spray boom available. Its spray system features precise application, measurement, and control.

The Spray Star's 20-foot boom comes in three models, with raindrop or tee-jet models.

Its 160-gallon capacity, fiberglass tank is designed with an ultra-low profile for maximum visibility and operator safety.

The prime mover's ground speed ranges up to 11 mph.

An optional computerized control system monitors ground speed and application rate. Other options are a foam marker system, protective operator cab, electric cargo dumping system, Vicon spreader attachment and new "equalizer" boom which can be controlled electrically from the operator's seat. The boom is adjustable from 20-16 feet for close tight areas such as greens and tees.

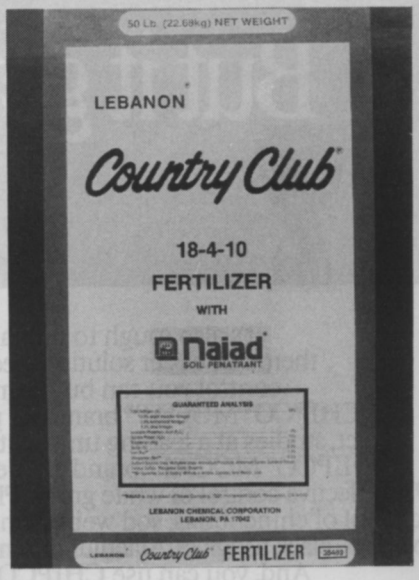
Circle No. 192 on Reader Inquiry Card

Fertilizer products contain penetrant, wetting agent

Lebanon Total Turf Care introduces Country Club 18-4-10 and Country Club 18-5-9 with Naiad soil penetrant for use on greens, tees, fairways and other professionally maintained turf areas.

These unique product formulations combine Lebanon's two most popular fertilizer grades with an effective wetting agent designed to increase absorption in water resistant soil surfaces.

Country Club 18-4-10 with Naiad is formulated to fertilize turf areas effectively and enable water to spread uniformly over soil surfaces and through

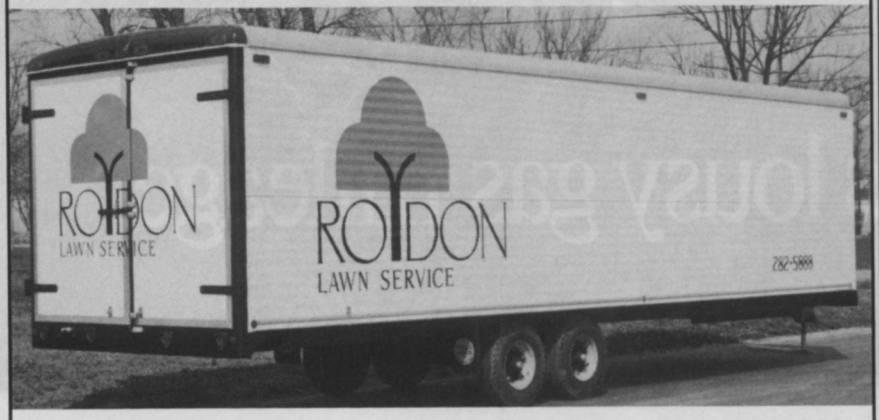


resistant soil structures.

This product has a 90 percent organic, homogeneous fertilizer base with 10 units WIN (water insoluble nitrogen), combined with the Naiad wetting agent. It is specially formulated for rapid penetration into the roots.

Circle No. 193 on reader Inquiry Card

"With a Wells Cargo Behind... You Never Look Back"



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SECURE, ORGANIZED AND READY TO ROLL

We can say, "We build the best". Our specifications sheets will back that up. But why else should you consider Wells Cargo? How about:

- **Factory Service Facilities - GA, IN, TX, UT.**
- **US Wide Dealer & Service Network.**
- **A Product Designed & Built for 15 Yrs. Hard Service, and More.**
- **Second-to-None 3 Yr. Warranty Coverage.**
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1-800-348-7553
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LANDSCAPE MGT.

WELLS CARGO SINCE 1954

WELLS CARGO, INC. P.O. BOX 728-837 ELKHART, IN 46515

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CLASSIFIEDS

RATES: $1.20 per word (minimum charge, $35). Bold face words or words in all capital letters charged at $1.45 per word. Boxed or display ads: $100 per column inch-1x (one inch minimum); $95-3x; $90-6x; $85-9x; $80-12x. (Frequencies based on a calendar year). Agency commissions will be given only when camera-ready art is provided by agency. For ads using blind box number, add $15 to total cost of ad. Send ad copy with payment to Dawn Nilsen, LANDSCAPE MANAGEMENT, 1 East First Street, Duluth, MN 55802 or call 218-723-9505. Fax Number 218-723-9615.

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LEARN Professional Landscaping and Gardening at home. Accredited program provides thorough training in all phases of commercial and residential landscaping. Certificate awarded. Free booklet describes program and opportunities in detail. Lifetime Career Schools, Dept. A-415, 2251 Barry Ave., Los Angeles, CA 90064. 9/90

WANT TO BUY OR SELL A GOLF COURSE? Exclusively golf course transactions and appraisals. Ask for our catalog. McKay Golf and Country Club Properties, 15485 N. East Street, Lansing, Michigan 48906. Phone (517)484-7726. TF

CONNECTICUT AND NORTHEAST: Selling or buying a green industry business? I'm a specialist in your field with over ten years experience and can locate buyers and sellers. Phil Nilsson (203)621-6199. 7/90

HELP WANTED

BRANCH/SALES MANAGERS; JUNIOR AND SENIOR LEVEL. Orkin Lawn Care offers more to our Managers, so why settle for less? Our company is a leader in its field and expansion dictates the need for senior level Branch and Sales Managers to maintain our high-standards and the integrity that has built the Orkin reputation. We offer unlimited room for advancement into top-level management, salary plus incentive bonus, and a comprehensive benefits package to talented, ambitious Orkin team members who are dedicated to success. You will report directly to Zone Managers and be required to: *Initiate and develop effective work atmosphere, *Meet financial objectives — revenue, cost control, profits and profit margins. *Enforce Orkin policies and procedures *Maintain a strong customer base *Select and train new employees. If you can fulfill these objectives and have the aptitude to prioritize duties and projects, send a confidential resume to: **ORKIN LAWN CARE, PAT GUY,** 2170 Piedmont Road, Northeast, Atlanta, GA 30324. 5/90

NEED LANDSCAPE WORKERS? We can solve any labor problem you have. We have documented workers as well as foremen, leadmen, irrigators and architects available at a price you can afford. Call today! **AMIGOS 214-634-0500.** TF

ESTATE MANAGER: Experienced person to manage Greenhouse, Formal and Vegetable Gardens. Lawn Care, including Insecticide Control. House, plus utilities available. BC-BS. Salary negotiable. Send resume to Box 4300, Wilmington, DE 19807. 5/90

HORTICULTURIST: Responsibilities include developing pest management and fertilization programs, conducting research, and providing technical training to field personnel. Knowledge of southern trees, shrubs, turf, ground covers, and bedding plants required. Good communication skills are essential. Ph.D. (M.S. will be considered) in horticulture or related field. Salary commensurate with experience. Send resume and three references to: The Davey Tree Expert Company, Attn: Richard Rathjens, 1500 N. Mantua St., Kent, OH 44240. 5/90

TURFGRASS SUPERINTENDENT/TURF NURSERY SUPERVISOR: Progressive family owned sod farm is seeking an individual with turfgrass and/or farming background. Turf experience and degree is preferred, but not required. Responsibilities include managing all phases of Kentucky Bluegrass development from seeding to mature sod. Applicant must provide leadership, like outdoor work and enjoy laxed off season. Salary commensurate with qualifications. Health benefits, retirement plan and profit-sharing available. Send resume to DeBuck's Sod Farms, 142 Mission Land Road, Pine Island, New York 10969. 5/90

ASSISTANT MANAGER OF GROUNDS MAINTENANCE. Vassar College seeks an individual to supervise and plan the work of the Department of Grounds Maintenance. The department is responsible for the maintenance of 1200 acres including the 450 acre central campus. Applicants must possess strong written and oral communication skills, have three to five years experience as a grounds and landscaping supervisor in a college setting, and a college degree (preferably in horticulture or landscape design: related experience considered). Must hold or be able to obtain N.Y. State Pesticide Applicator's License. Send resume and names of three references to: Director of Facilities Operations, Box 25, Vassar College, Poughkeepsie, N.Y. 12601. AA/EO Employer. 5/90

"Consider all of your employment options in the irrigation and landscape industries. Call **Florapersonnel,** the international employee search firm for the ornamental horticulture industry. Completely confidential. Employer pays fee. **Florapersonnel,Inc.,** P.O. Box 1732, 1450 S. Woodland Blvd., Suite 201, DeLand, FL 32721-1732. (904)738-5151. Jeff Brower, Joe Dalton, David Shaw, CPC, Bob Zahra, CPC." TF

LANDSCAPE MAINTENANCE PRODUCTION MANAGER: Rapidly growing Central Florida Landscape firm seeking an experienced production manager with strong people and organizational skills. Experience with large commercial accounts and a sincere desire to build a business based on customer service a must. Strong Salary and Benefits. Must relocate to Orlando. Send resume to: Mr. Khalsa, 1174 Florida Central Pkwy., Longwood, Florida 32750. 5/90

Assistant Supervisor - Department of Facility Operations: Strong leader needed for multiple site field supervision and management of landscape maintenance, installation, irrigation, and nursery operations. Liberal benefits. Annual salary $26,004. Send resume to: School Board of Palm Beach County, Department of Facility Operations, Attn: Joseph T. Lawson, 3300 Summit Boulevard, West Palm Beach, FL 33406. 407-687-7024/Landscape Section. 5/90

LANDSCAPE DIVISION MANAGER: well established, rapidly growing company seeks individual to take over for retiring manager. Individual must be able to run both a maintenance and a planting division simultaneously. Requires exceptional organizational/management skills as well as complete command of plant materials and maintenance techniques. For consideration contact David Gorter, 855 Skokie Highway, Lake Bluff, IL 60044. 708-615-0800. 5/90

HORTICULTURE

FOREMAN

Arboriculture Division

LONGWOOD GARDENS, INC., a world renowned horticultural display garden, has an opening for an experienced person to supervise the Arboriculture Division.

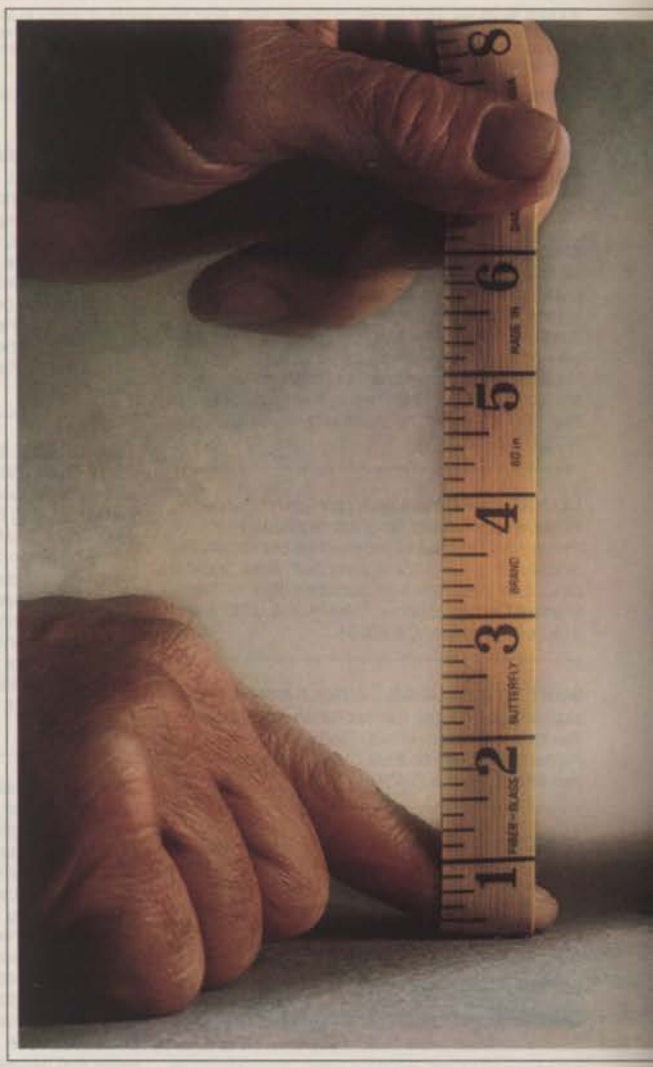
Candidates should have a BS degree in Forestry, Horticulture, or a related field and at least three years of supervisory experience in arboriculture, including: tree care; pest management; vine, hedge and shrub pruning; general landscape maintenance. Good field leadership, planning, communication, scheduling, coordination and supervisory skills are required.

We offer an excellent starting salary and a very competitive benefits package. Please mail your resume to: **Mr. Kiran Taunk, Business Division Manager, LONGWOOD GARDENS, INC., P.O. Box 501, Kennett Square, PA 19348-0501.**

Equal Opportunity Employer, M/F.

Longwood Gardens INC

Introducing Tempo For Home Lawns And Ornamentals.



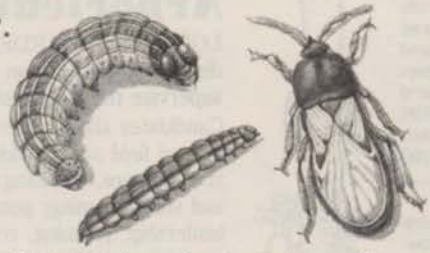
Use new TEMPO™ 2 ornamental insecticide and it will become your new standard of measure for all other insecticides. New TEMPO is the first affordable pyrethroid labeled for both ornamentals and home lawns. Better yet, it treats the same area as effectively as the leading insecticide, but with 80% less active ingredient. And that's a sizeable difference.

Weigh the alternatives. New TEMPO uses approximately 80% less active ingredient than the leading insecticide. Which means there's approximately 80% less chemical for you to carry around. And 80% less chemical to impact the environment.

How To Size Up

Measure the effectiveness. TEMPO is a broad-spectrum, advanced-generation pyrethroid.

In simple terms, TEMPO effectively controls the surface-feeding insects attacking your customers' lawns. Plus, TEMPO controls the toughest ornamental pests. So using TEMPO eliminates the need to stock several different insecticides.



TEMPO effectively controls surface-feeding pests like cutworms, armyworms, chinch bugs, and sod webworms.

Here's another good reason to put TEMPO in your tank. More and more of your customers have a growing concern about Lyme disease. TEMPO effectively controls the deer tick which carries the Lyme disease virus.

Calculate the cost. TEMPO is the first affordable pyrethroid labeled for use on home lawns. Better yet, it's competi-

And 80% less chemical means fewer handling, mixing, and disposal hassles. In addition, TEMPO tank mixes with most fungicides and fertilizers.

Analyze the safety. TEMPO has a very low mammalian toxicity. So TEMPO offers maximum safety for your customers and your employees.

TEMPO is not a cholinesterase inhibitor like other insecticides. So you don't have the chore of constantly monitoring your applicators. And you don't have the applicator downtime caused by cholinesterase depression.

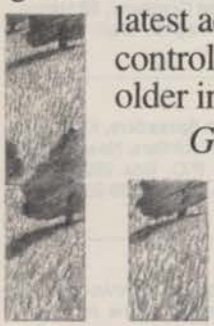
TEMPO reduces exposure to your customers, your employees, and the environment.

Add it all up. Effective broad-spectrum control on both lawns and ornamentals. Reduced handling, storing, and disposal. Reduced potential for exposure to your customers, your employees, and the environment. Plus, TEMPO has virtually no odor. And it's competitively priced.

Now contact your Mobay distributor or Mobay representative. Then compare insecticides. We think you'll find that new TEMPO has some sizeable advantages.

Your Insecticide.

tively priced with what you probably use right now. So with TEMPO, you get the latest advancements in insect control for the same price of the older insecticides.



TEMPO uses 80% less active ingredient than the leading insecticide.

Gauge the work involved. TEMPO uses 80% less active ingredient than the leading insecticide. So, TEMPO takes up 80% less storage space, both on and off the truck.

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Specialty Products Group
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IRRIGATION SPECIALISTS - Time for a move to the drought stricken San Francisco Bay area - Excellent opportunities - Join an Environmental Care, Inc. team. Send resume to 825 Mabury Road, San Jose, CA 95133. 7/90

FOREMEN TRAINEES: Washington, D.C. Area Design-Build Firm is looking for career minded individuals who want to learn top-of-the-line residential landscaping-construction, planting and landscape maintenance. Some experience and/or education in horticulture or landscaping helpful but not necessary. We work a 4-5 day week and offer good pay with benefits. Send resume to: **GARDEN GATE LANDSCAPING,** 821 Norwood Road, Silver Spring, MD 20904. 5/90

LANDSCAPE ARCHITECTS DESIGN/ESTIMATING/SALES: We are seeking landscape architects to add to our design/build *sales* staff. This is an excellent opportunity to grow with one of the premier landscape contractors in the Milwaukee metro area. Contact **THE HAWKS NURSERY CO.,** Jim Bennett, (414)258-5525. 5/90

LANDSCAPE DESIGNER/SALESPERSON: Long-established design/build landscape firm has opening for landscape designer/salesperson. Three to five years design/build experience required. Send detailed resume to **HUNZIKERS INC.,** P.O. Box 397, Niles, MI 49120. 5/90

KT ENTERPRISES, INC., a commercial landscape management firm servicing the Washington, DC Metropolitan market, is now accepting applications for employment in their landscape maintenance department for the 1990 season and beyond. All positions offer excellent salary, health benefits, retirement and, most importantly, an incomparable opportunity to work in a quality organization that will continue to offer professional satisfaction. Please send resume to: Mr. Doug Sevachko, KT Enterprises, Inc., 4001 Westfax Drive, Chantilly, VA 22021 if you're interested in any of the following positions: Pruning Department Supervisor, Maintenance Department Supervisor, Maintenance Department Manager, Pruning Department Manager, Floral Installation Manager, Turf and Ornamental Plant Specialist. 5/90

1988 Kubota M4030 Tractor, Loader w/72" bucket, 372 hours. Like new, $16,500. David Vital 401-738-4880. 5/90

CITY FORESTER: Education, experience and knowledge: Bachelor's Degree in urban forestry, arboriculture, horticulture or closely related field and supervisory experience. Thorough technical knowledge of tree and plant care including disease and pest control. Ability to communicate both written and orally. Duties: Schedule, plan and supervise tree, shrub and flower planting, tree trimming and removal operations. Plan and design landscape area throughout the city and park. Purchase plant material and related equipment and supplies. Prepare specifications and receive bids and quotes. Assist and communicate with other city departments and committees, outside agencies, governing bodies, general public and various media. Coordinate special events, assist with budget process and record keeping, hire, discipline and conduct performance of employees and coordinate and oversee contract operations. Please send resume to: **THE CITY OF OVERLAND PARK,** 8500 Santa Fe Drive, Overland Park, KS 66212. 5/90

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SAVE YOURSELF OR YOUR EMPLOYER BIG $$$

Trap skunks, raccoons, squirrels, woodchucks and other animals from buildings or grounds.

This is an instructional video cassette providing basic procedures to trap and remove nuisance wildlife. This video discusses types of equipment, selection of baits, professional trapping procedures, animal behaviors, live trapping cases, and more.

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P.O. Box 5628, Harrisburg, PA 17110-0628
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NEW AND USED BROUWER EQUIPMENT: Mowers - VACS - Fork Lifts - Harvesters - and full line of replacement parts. Contact Glenn or Ed Markham at 1-800-458-3644. TF

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KELWAY® professional **SOIL ACIDITY** and **SOLUBLE SALTS TESTERS,** available from distributors nationwide. **HB-2** and **SST** brochures from **KEL INSTRUMENTS CO., INC.,** Dept. 1, P.O. Box 2174, Vineyard Haven, MA 02568. (508)693-7798. 11/90

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JACOBSEN AND TORO: 7 gang fairway mowers rebuilt and sharpened - $4,900. Also 5 gang available. (313)653-5695. 5/90

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Now SEVIN® brand carbaryl insecticide is available in an easy-to-handle granular formulation. So you have two ways to apply the effective, economical and environmentally sound control of SEVIN® brand carbaryl on your toughest turf pests.
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Tests prove that SEVIN® brand carbaryl insecticide delivers effective control of white grubs, sod webworms, chinch bugs, bluegrass billbugs, cutworms and more than two dozen other turf pests. Plus, the liquid formulation can be used to control 86 troublesome insects on trees and ornamentals.
And, because other formulations of SEVIN® brand carbaryl insecticide are used to control pests on poultry, pets and even some species of game birds, it's one of the most environmentally sound pesticides you can use.
Contact your turfcare chemicals distributor today, and put the proven performance of SEVIN® brand carbaryl insecticide to work for you. Now available in a quality granular formulation.
Sevin®
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As with all crop protection chemicals, always read and follow instructions on the label.
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MODEL 500

VERSATILITY

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STANDARD TAR PRODUCTS CO., INC.
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PORTABLE STUMP CUTTER - 14 or 16 H.P. Mag Kohler, 4 speed transaxle - 34 1/2" wide. Kinetic Stump Cutter, Inc. 1-800-422-9344. 9/90

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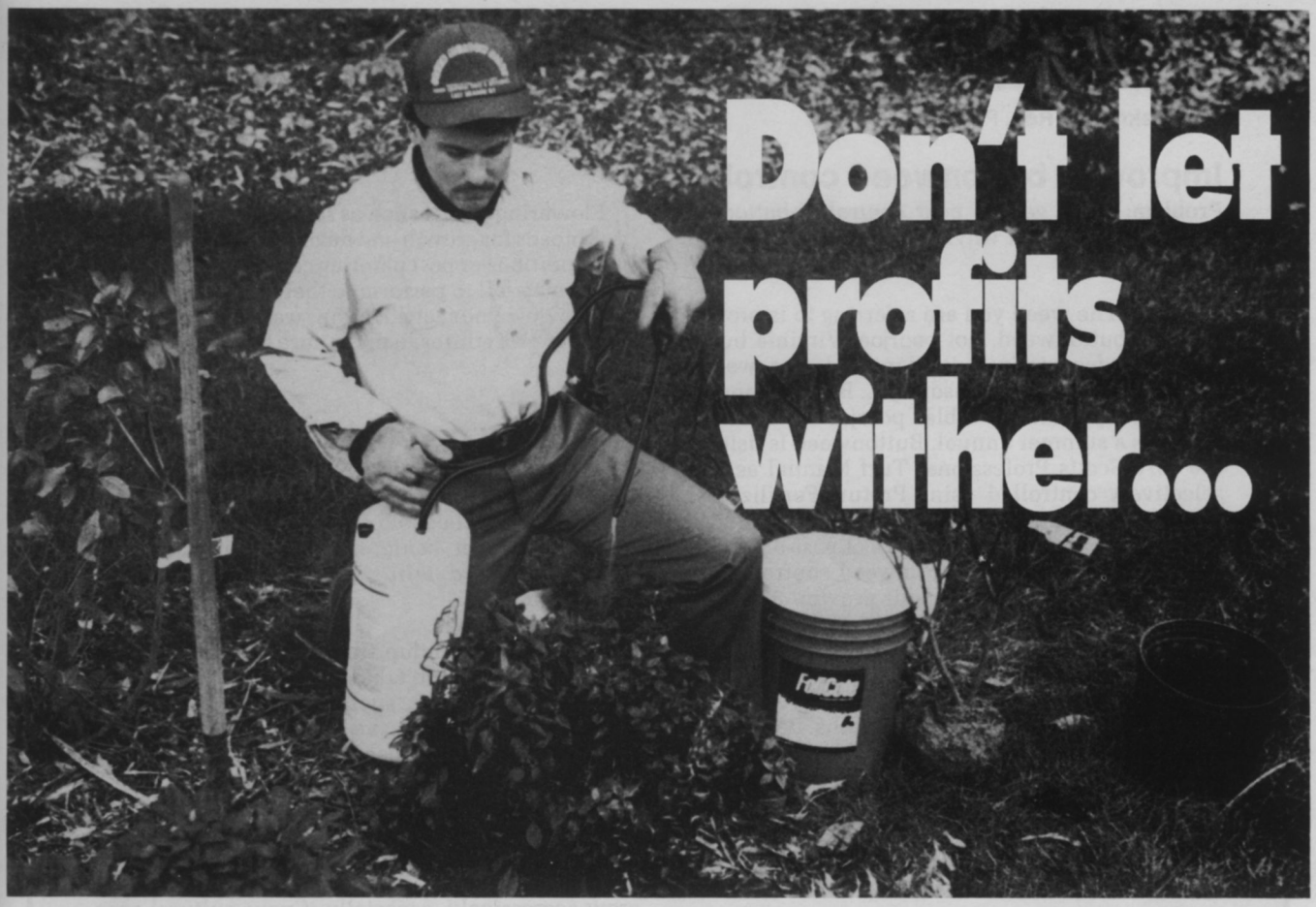

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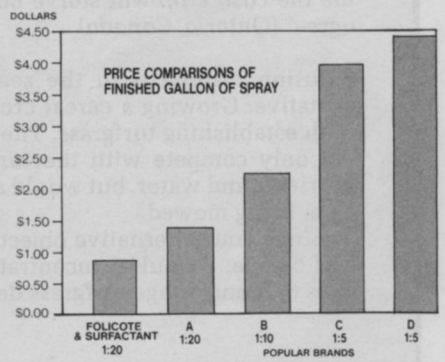

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PROBLEM MANAGEMENT

by **Balakrishna Rao,** Ph.D.

Improving buttonweed control

Problem: *We're getting poor control of buttonweed and can't figure out why. Do you have any suggestions? (Virginia)*

Solution: The weed you are referring to is probably Virginia buttonweed, not poorjoe. Virginia buttonweed *(Diodea virginia)* is identified as a weed of lawns in *Weeds of Arkansas* by L. Baldwin and E.B. Smith. This plant resembles poorjoe *(Diodia teres)*, which is a summer annual. Buttonweed is lisited in the 1976 Scotts Professional Turf Manual as being selectively controlled using Proturf Fertilizer and Dicot Weed Control.

According to field evaluations of post-emergence herbicides for Virginia buttonweed control in turf, one application of Trimec will provide 80 percent control. However, regrowth will occur within 72 days after treatment. This will require treatments as needed.

The best selective treatment would be a herbicide mixture containing 2,4-D and dicamba. Both Trimec and Super Trimec contain these. Make sure that the weeds are up and actively growing. Proper timing, mixing and thorough coverage is also important to obtain good results.

Mixing cash crop and grass

Problem: *I wish to seed 180 acres of golf course land with grass and a cash crop of oats, barley, or spring wheat. A representative of a large seed company told me the cash crop will starve out the grass. Do you agree? (Ontario, Canada)*

Solution: I agree with the seed company representative. Growing a cereal crop is not compatible with establishing turfgrass. The cereal crops would not only compete with the turfgrass for sunlight, nutrients and water, but would also prevent the turf from being mowed.

Since your alternative objective is to establish a golf course, I would concentrate on cultural practices that encourage turfgrass development.

Those bloomin' magnolias

Problem: *We have a client who has a southern magnolia that has never flowered. Can you please explain why. Is there anything we can do to induce flowering? (Georgia)*

Solution: Dr. Michael Dirr from the University of Georgia mentioned in his book, *Manual of Woody Landscape Plants*, that it may take southern magnolia *(Magnolia grandiflora)* that have been grown from seed as long as 15 to 20 years to flower. Perhaps this may be a contributing factor.

Many plants enter the reproductive cycle after completing vegetative growth. In some situations plants that are exposed to adverse stress tend to produce flowers.

Flowering plants such as magnolias require their basic needs for growth and development. If the growing conditions or post planting care are not adequate, plants may fail to perform to their maximum potential. Review your fertilization, water and pest management procedures to make sure this isn't the case.

Rounding up bentgrass

Problem: *After applying Roundup to remove unwanted growth from an area two years ago, we successfully established four varieties of bluegrass there. Recently however, bentgrass has crept back in. What happened and what can we do about it? (Massachusetts)*

Solution: The Roundup treatment you applied two years ago might have taken care of a majority of the bentgrass plant parts, such as the stolons and rhizomes, but some may have already grown out of the major areas and into adjacent areas. These parts may have escaped your Roundup application.

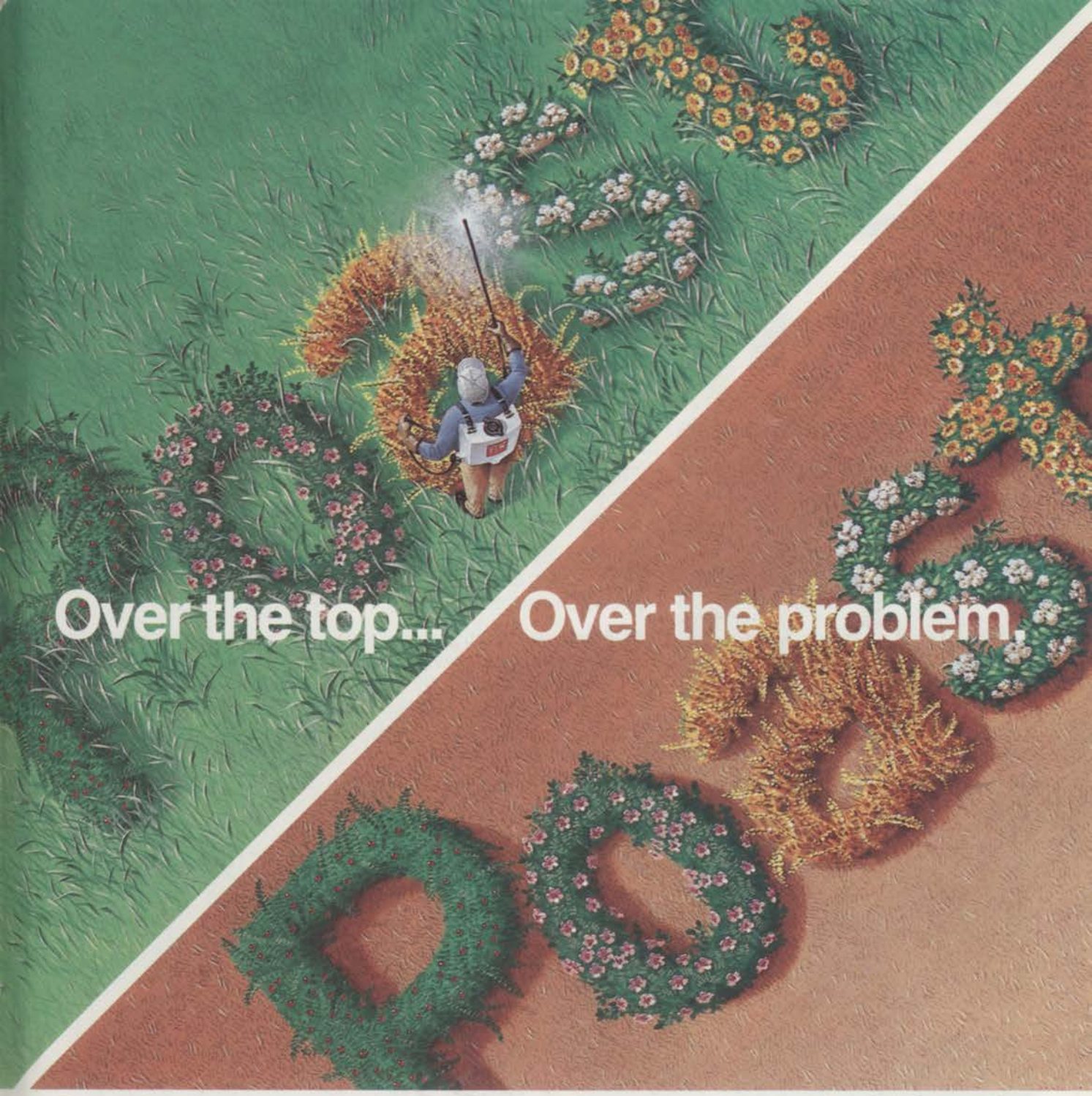
Another possibility is re-infestation of bentgrass from other areas such as neighbors' yards or golf courses.

Once introduced into a lawn, bentgrass plants grow aggressively, especially if your cultural practices include short mowing and abundant watering. Evaluate your cultural practices and promote those that favor bluegrass establishment.

Kentucky bluegrass performs well when mowed at 2 to 2½ inches. Generally, one inch of water per week is sufficient for most soils. Sandy soils may require more frequent watering. Therefore, study the soil type and provide water as needed. **LM**

Balakrishna Rao is Manager of Technical Resources for the Davey Tree Co., Kent, Ohio.

Questions should be mailed to Problem Management, LANDSCAPE MANAGEMENT, 7500 Old Oak Boulevard, Cleveland, OH 44130. Please allow 2-3 months for an answer to appear in the magazine.



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